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Apply Pesticides Correctly: A Programmed Instruction Learning Program for Private Applicators

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This programed text on pesticide application provides practical information needed to meet the minimum Federal regulation requirements for the use of certain pesticides. The seven chapters cover pest and pest control, pesticides, labels and labeling, application equipment, use and maintenance of equipment, using pesticides safely, and the environment and the law. Each chapter consists of a pretest, posttest, and the learning program. The test questions require learner response and provide for immediate feedback.

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APPLY PESTICIDES CORRECTLY

A programmed instruction learning program for private applicators

REVISED MARCH 1976

U.S. ENVIRONMENTAL PROTECTION AGENCY

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Joel R. Meltzner organized the project and served as editor. Other people contributed greatly to the workbook by reviewing it at various stages. They represent EPA, USDA, State extension and regulatory agencies, and private applicator validation groups in North Carolina and Kansas.

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INTRODUCTION

Federal regulations set minimum requirements that you must meet before you can use certain pesticides. This program contains the practical information you need to prepare you to meet most of these requirements. It does not include all the things you need to know about the pests you wish to control. It may not include all the information you may be required to know to meet your State requirements. Your State Pesticide Regulatory Agency and your State Extension Service can give you this additional information.

This program will teach you:

- some features of common pests, how they develop, and the kinds of damage they do,
- methods you can use to control pests,
- how pesticides work,
- how pesticide labels can help you,
- how to use pesticides so they will not harm you or the environment,
- how to choose, use, and care for some equipment, and
- the Federal laws that apply to your use of pesticides.

INSTRUCTIONS FOR USING THIS LEARNING PROGRAM

The Learning Program you will be working with is a new kind of training method called Programmed Instruction. The program is laid out in a different way from most of the training materials you have used in the past.

First, answer as best you can the questions on the pre test at the beginning of each Chapter, before you begin that Chapter. Don't worry, you are not expected to know all of the answers. Then proceed to the Learning Program portion of each Chapter.

In each Learning Program, you will be given a small piece of information and then asked to answer a question in writing. The answer to each question is provided next to the next frame. This means that, after you have written your response to each question, you must look below or turn the page to find out if you were correct.

Before starting the Learning Program, take a piece of paper and fold it lengthwise, just wide enough to cover the answer column. As you complete each frame, slide the paper down and check your answer.

When you finish all frames of each Chapter, complete the post test in the back of each Chapter.

BEFORE YOU BEGIN!

In order to experience the most learning from this type of instruction, you should do five things . . .

- Read very carefully.
- *Write* the answer as it is called for. Don't merely answer it in your mind.
- *Check* each answer or response as soon as you've written it. This is why the correct responses are provided.
- If you find that your response was not correct, figure out why it is wrong. You may reread the frame or turn back to earlier frames. Don't go forward in the program until you understand the correct answer.
- When you know why your answer was wrong, go back and *change your answer*. Cross out your earlier response and write in the right one.

CHAPTER 1

PESTS AND PEST CONTROL

PRE TEST

Answer the following questions true or false:

1. Fungi, nematodes, viruses and bacteria may cause plant diseases.

   A. true
   B. false

2. Air pollution may cause plant disease.

   A. true
   B. false

3. Annual weeds produce seed in the second year of growth.

   A. true
   B. false

4. A corn plant growing in a tobacco field can be called a weed.

   A. true
   B. false

5. If pests are present they should be killed whether or not they are causing any damage.

   A. true
   B. false

6. Frogs might be considered as pests.

   A. true
   B. false

7. Plant diseases can be caused by non-living agents.

   A. true
   B. false

8. Spiders are not insects.

   A. true
   B. false

9. Most insects have the same type of mouth parts.

   A. true
   B. false

10. *Any* plant can be a weed.

    A. true
    B. false

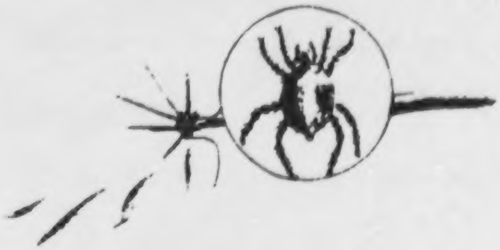
11. Incomplete development of a plant's flowers can be an indication of plant disease

A. true
B. false

Answer the following multiple choice questions:

12. The animal shown here:

A. is an insect
B. is a mite.
C. Both of these.



13. If you are trying to tell one insect from another, the most important things to look at are the:

A. wings and mouth parts.
B. body size and shape.
C. color and body markings
D. legs and abdomen.

14. Insect pests can:

A. feed on and tunnel in roots
B. carry plant disease agents.
C. feed on and in seeds and nuts.
D. All of these.

15. Which of these are possible pests?

A. dogs.
B. weeds.
C. viruses.
D. All of these.

16. What do you call plants that live for 2 years?

A. annuals.
B. perennials.
C. biennials.
D. winter annuals.

17. A tree is an example of:

A. an annual.
B. a biennial.
C. a perennial.
D. a semi-annual.

18. Match the following:

A. Fungi: ________
B. Nematode: ________
C. Bacteria: ________
D. Viruses: ________

1. Cause rots and scabs.
2. Cause blights, wilts and scabs.
3. Cause mosaic disease.
4. Cause root cysts and knots.

19. Match the following:

A. Summer annual: ________
B. Winter annual: ________
C. Biennial: ________
D. Perennial: ________

1. Sprouts in the spring and lives for year or less.
2. Sprouts in the fall and lives for year or less.
3. Lives through two (2) growing seasons.
4. Lives for several years or indefinitely.

Answer the following questions by filling in the blanks:

20. Name five (5) techniques of pest control without using pesticides:

A. Plant ________________ resistant varieties.
B. Use good ________________ management.
C. Destroy ________________ residues.
D. Clean ________________ and cultivation.
E. Encourage pests natural ________________.

21. Insects have ________________ legs.

22. Insect bodies have ________________ regions.

23. A ________________ is a plant out of place.

24. Spiders have ________________ legs.

25. Winter annuals sprout in the ________________.

CHAPTER 1

PESTS AND PEST CONTROL

LEARNING PROGRAM

	1. When people think of pest control the first thing that enters their minds is killing pests with pesticides. While pesticides are an important part in the pest control process, they are by no means the whole story. In fact, the use of chemicals may, in some cases, be the least preferable choice. Several steps must be taken before this point is reached. This unit will cover: (1) what is a pest, (2) how to recognize pests, and (3) what steps can be taken to control pests. GO ON TO THE NEXT FRAME
	WHAT IS A PEST? 2. A pest is something that threatens crops, livestock or other products. This may be some plant, animal, or disease that is producing the threat. A pest would be something that: A. Damages crops. B. Harms domestic animals. C. Takes up food and space needed by crops. D. All of these.
D **All of these.**	3. Blackbirds may eat animal feed. Could blackbirds be considered a pest? (yes/no)
yes	4. Weeds may take up food, water and space needed by crops. Weeds (are/are not) pests.
are	5. Plant disease agents need not be living things. For example, frost may kill tomato plants. Could frost be considered a disease agent of tomatoes? (yes/no)
yes	6. Which of the following might be done by a pest? Damage fruit (yes/no) Prevent plants from maturing (yes/no) Spread disease (yes/no) Injure livestock (yes/no)

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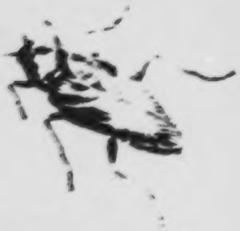
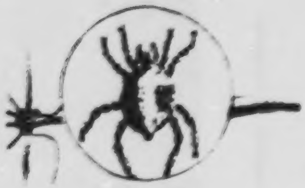
RECOGNIZING PESTS

All yes, each of these might be done by a pest.	7. Each type of pest that may be causing problems requires specific control methods. Could one control method work on all pests? (yes/no)
no	8. A treatment of potatoes with an insecticide should be designed to kill: A. All insects. B. Just the insects that are damaging the potatoes.
B **Just the insects that may be damaging the potatoes.**	9. Even pests that may look alike may not be controlled by the same pesticide. To the untrained eye, bugs and beetles may look alike. However, an insecticide that works on beetles: A. Must work well for bugs. B. May not work at all on bugs.
B **May not work at all on bugs**	10. Therefore, before you can control pests you must: A. Buy the right insecticide. B. Recognize the pest.
B **Recognize the pest.**	11. You examine young corn plants and find damaged leaves. You should: A. Find the pest causing the trouble. B. Start some type of treatment immediately before the crop is destroyed.
A **Find the pest causing the trouble.**	12. Pests can be put into 4 main groups: Insects (and mites, ticks and spiders). Pest animals. Weeds. Plant disease agents. We will consider the insects first. Insects are found in a variety of sizes, shapes, colors, etc. But they all have one thing in common. The adult insect has *six* legs. A millipede is a small worm-shaped creature whose name means "thousand legs". A millipede (is/is not) an insect.

is not

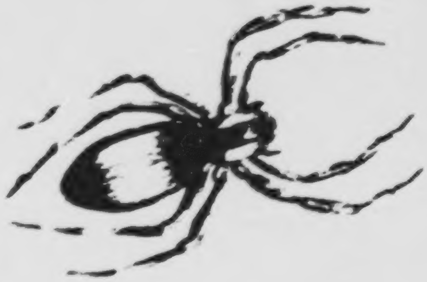
13. Which of these is an insect?


A.


B.

A
Because it has six (6) legs.

14.



Spiders, mites and ticks are similar to insects, but they have:

A. Six (6) legs.
B. Eight (8) legs.

B
Eight (8) legs.

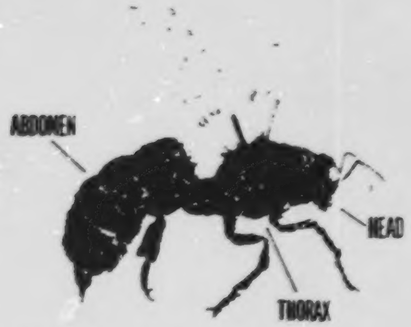
15. Spiders (are/are not) insects.

are not

16. You find something crawling on your dog that looks like a small flat brown bug. It has eight (8) legs. It is:

A. An insect.
B. A tick.

17. The adult insect has three (3) body regions



GO ON TO THE NEXT FRAME

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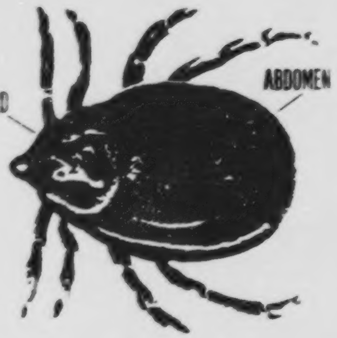
18. Mites, ticks and spiders have bodies different than insects. They do not have wings.



In addition, the bodies of mites, ticks and spiders are divided into ______ body regions instead of three (3).

Two (2)

19. An insect has ______ legs and ______ body regions.

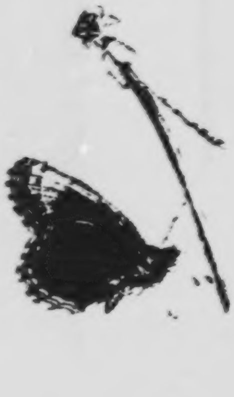
---

six (6) ;
three (3)

20. Once you have recognized a pest as an insect, the next step is to find out the type of insect. One of the most distinctive things about insects is their wings.

Some insects have no wings. Others have two (2) or four (4) wings. The wings may vary in shape, size, thickness and structure. If you were attempting to identify an insect, what would you check first?

A. Its wings.
B. Its color.
C. Its shape.



[illegible]

21. Insects feed in different ways. Those with chewing mouth parts bite and tear food. Some insects have long beaks that can suck out fluids or blood.

Therefore, examining (choose one: (color/mouthparts)) is important in helping you identify insects.

---

22. Check the two (2) most important things you should look at when identifying insects:

Size ______
Shape ______
Wings ______
Antennae ______
Mouth Parts ______

[illegible]

23. What two (2) things can help you identify insects?

1. ________________
2. ________________

Wings
Mouth Parts

24. The next group of pests are pest animals such as fish, snakes, turtles, alligators, frogs, toads, salamanders and birds.

However, for an animal to be a pest it must threaten man in some way. An animal that is a pest in one location may not be a pest in another location.

For example, a coyote that kills sheep (is/is not) a pest.

---

is

25. A coyote located where there is no livestock, and only feeds on crop-destroying rodents (is/is not) a pest.

---

is not

26. Which of these is an animal pest?

A. Carp that destroy game fish eggs.
B. Carp that are used for food.

A.
[illegible] destroy game fish

27. What determines if an animal is a pest?

A. Where it is and what it is doing.
B. What type of animal it is.

A.
Where it is and what it is doing.

28. A third type of pest is the weed.

A weed is simply a plant that is out of place–growing where we do not want it to grow.

For example, grass growing in a corn field is considered a ________________.

29. Any plant can be a weed. In fact, some weeds are cultivated plants. An example of this is corn.

Corn is:

A. A weed.
B. A weed only if it is growing where we do not want it.

---

30. Which of these is a weed?

A. Corn grown for food.
B. Corn growing in the middle of a soybean field.

---

31. Before you can control weeds you need to know how they grow. Many weeds live only one (1) year. These grow from a seed, mature, produce more seeds, and then die before the year ends.

Plants that live only one (1) year or less are called annuals. Which of these is an annual?

A. Crabgrass that dies after producing seed.
B. An oak tree.

---

32. An annual is a plant that lives one (1) ________________ or less.

---

33. A *summer* annual grows from a seed that sprouts in the spring and lives through the summer.

A *winter* annual grows from a seed that sprouts in the fall and lives through the winter.

Wheat that sprouts in the fall is a ________________ annual.

Wheat that sprouts in the spring is a ________________ annual.

---

34. Which of these lives longer than a year?

A. Winter annual.
B. Summer annual.
C. Neither one.

---

35. "Bi" means two (2). A biennial plant is one that lives for:

A. One (1) year.
B. Two (2) years.

[redacted]

36. A biennial plant grows from a seed and develops a heavy root the first year. This allows the plant to survive one (1) winter. The biennial then produces seeds during the second year and dies.

A bullthistle is a heavy-rooted plant that survives one (1) winter and two (2) growing seasons. A bullthistle is:

A. A biennial.
B. An annual.

---

37. The winter annual also lives through a winter, but it has only one (1) growing season. The bullthistle can live for ________________ seasons.

---

38. Some plants can live for more than two (2) seasons, and may even live indefinitely. These plants are called *perennials.*

An oak tree is:

A. An annual.
B. A biennial.
C. A perennial.

---

39. Even though the leaves and stems die every year, plants such as the tulip live through the winter as bulbs. A tulip can live for many years.

A tulip is:

A. An annual.
B. A biennial.
C. A perennial.

---

40. Match the following:

A. Sprouts in the fall and lives for one growing season: ________
B. Sprouts in the spring and dies before winter: ________
C. Lives for 2 years: ________
D. Lives for several years: ________

1. Perennial
2. Biennial
3. Winter annual
4. Summer annual

---

41. An annual weed lives for how long?

____

A biennial weed lives for how long?

____

A perennial weed lives for how long?

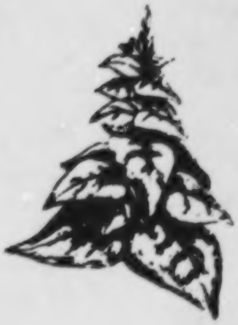
____

42. The fourth group of pests are plant diseases.

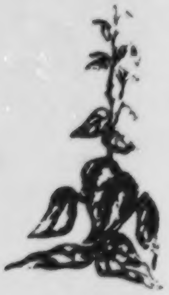
A plant disease is a harmful condition that makes a plant different than a normal plant.

Which of these is a diseased plant?

A.



B.



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43. Plants react to disease agents in a variety of ways. Some of these are:

- Galls, swellings, and leaf curls.
- Stunting, lack of green color, and incomplete development of parts.
- Blights, leaf spots, wilting, and cankers.

A plant fails to develop fruit. Could this be due to a disease agent? (yes/no)

---

44. Which of these is the result of disease?

A. Stunting.
B. Lack of green color.
C. Incomplete development of plant parts.
D. All of these.

---

45. Plant diseases can be caused by living or non-living agents. Non-living plant disease agents are such things as frost, air pollution, drought, etc.

Lack of water will cause a plant to wilt. Does lack of water cause a plant disease? (yes/no)

---

46. A crop damaging frost would be an example of:

A. A living plant disease agent.
B. A non-living plant disease agent.
C. Neither of these.

47. A plant is damaged by frost. A healthy plant is planted next to it. Can the healthy plant pick up this disease? (yes/no)

---

48. Diseases caused by non-living agents (can/cannot) be passed from one plant to another.

---

49. The most common four (4) types of living agents that can cause plant disease are:

- Fungi.
- Bacteria.
- Viruses.
- Nematodes.

GO ON TO THE NEXT FRAME

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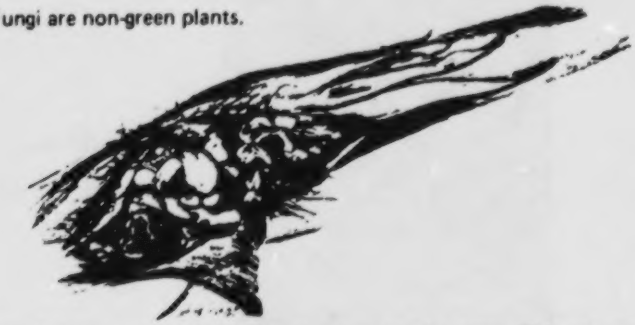
50. Fungi are non-green plants.

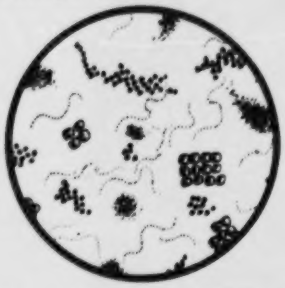


Fungi damage the plant when it grows on the plant. This can appear as *scabs* or *rots*.

A plant shows signs of rot. It has been infected with what disease agent? ________________

---

51. Bacteria are also living disease agents.



Bacteria are microscopic one-celled plants. They cause blights, wilts and scabs.

Match the following:

A.	Bacterial diseases: ______	1.	Rots or scabs.
B.	Fungal diseases: ______	2.	Blights, wilts or scabs.

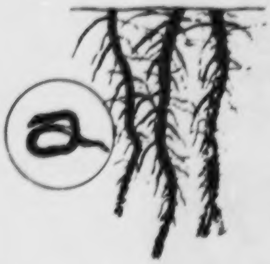
52. Viruses are extremely tiny particles that can reproduce like other living things. They cause mosaic disease.

The tobacco mosaic disease is caused by:

A. Viruses.
B. Bacteria.
C. Fungi.

---

53. Other disease causing agents are nematodes (pronounced nem-a-toads). These are tiny roundworms that often live in or on plant roots.



Which of the following disease agents is an *animal?*

A. Fungi. B. Nematodes. C. Viruses.

---

54. Nematodes may live in plant roots and cause root knots and cysts.

Match the following:

A.	Fungi:	______	1.	Blights, wilts or scabs.
B.	Bacteria:	______	2.	Mosaic disease.
C.	Viruses:	______	3.	Root knots and cysts.
D.	Nematodes:	______	4.	Rot or scabs.

---

55. Living disease agents can be spread from one plant to another. For example, if a healthy plant is growing near one with a blight, the healthy plant (can/cannot) get the blight from the diseased plant.

---

56. Which plant disease agent can be spread from plant to plant. Diseases caused by:

A. Living agents.
B. Non-living agents.
C. Both of these.

[redacted]

PEST CONTROL

57. Once the pest has been identified, specific control measures can be applied.

However, just because a pest is present is no justification for using pest control methods. Pest control is necessary only when the pest is causing more damage than is reasonable to accept.

Pest control methods are necessary when:

A. A pest is present.
B. The pest is causing some damage.
C. The pest is causing too much damage.

---

58. When pest control is needed, you may not want to use pesticides. Using pesticides is only one of many ways to control pests.

Another way to control pests is to plant pest resistant varieties of plants.

For example, some strains of tomato plants are resistant to blight disease. If blight disease is a problem you should use:

A. Pesticides.
B. Blight resistant plants.

---

59. A method of reducing pest problems is to use ________________ resistant varieties of plants.

---

60. The crop residues left over from last year's harvest may contain disease agents such as fungi or bacteria.

Can crop residues help spread pests? (yes/no)

---

61. Another way to control pests is to destroy crop ________________ after harvest.

---

62. Pests can be controlled by using good manure management. Manure management will remove the food some pests need.

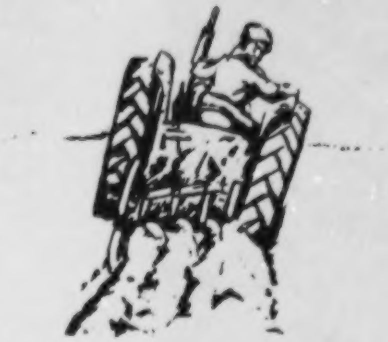
Manure management works by:

A. Killing pests
B. Remove the food some pests need.

---

63. Another pest control method is by using good ________________ management.

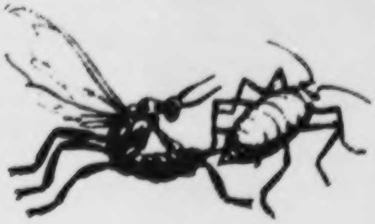
64. Clean plowing and cultivation destroys weeds and crop residues.



Is clean plowing and cultivation a pest control method? (yes/no)

---

65. Pests have natural enemies. For example, certain wasps kill pest insects. Should you encourage pest killing wasps to come in and kill pest insects? (yes/no)



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66. Pesticides can kill pests' enemies as well as the pest themselves. You (should/should not) use pesticides while pests' natural enemies are active.

---

67. Name five (5) methods of pest control without using pesticides:

A. Plant pest ________________ varieties of plants.
B. Use good ________________ management.
C. Destroy crop ____________ ____.
D. Clean ____________ and ________________.
E. Encourage use of pests' natural ________________.

REVIEW AND SUMMARY

68. Insects have:

A. Six (6) legs.
B. Eight (8) legs.
C. Ten (10) legs.

69. Insect bodies are divided into ________________ body regions.

70. Spiders, ticks and mites have ________________ legs. Their bodies are divided into ________________ regions.

71. Which of these could be a pest animal?

A. Birds.
B. Frogs.
C. Mammals.
D. All of these.

72. A weed is:

A. A type of strong rooted plant.
B. Any plant that is growing where it should not.

73. An annual weed has a life of:

A. One (1) year or less.
B. Two (2) years.
C. Several years.

74. Which of these sprouts in the fall?

A. Winter annual.
B. Summer annual.

75. Biennials live for ________________ years.

76. Which of these is the longest lived?

A. Summer annuals.
B. Biennials.
C. Perennials.

77. Plant diseases can be caused by:

A. Living agents.
B. Non-living agents.
C. Both of these.

78. An example of non-living disease agent is:

A. Frost.
B. Nematodes.
C. Both of these.

[redacted]

79. Match these:

A.	Fungi:	______	1.	Mosaics.
B.	Bacteria:	______	2.	Scabs and rot.
C.	Viruses:	______	3.	Blights, wilts and scabs.
D.	Nematodes:	______	4.	Root knots and cysts.

80. Which of these is a plant reaction to disease agents?

A. Galls.
B. Lack of green color.
C. Incomplete development of parts.
D. All of these.

81. Name five (5) methods of pest control other than using pesticides:

A. Plant pest ______________ varieties.
B. Destroy crop ______________.
C. Use good ______________ management.
D. Clean ______________ and ______________.
E. Encourage use of pests' natural ______________.

You have just completed Chapter 1, Pests and Pest Control. Now complete the Post Test found in the back of this Chapter.

CHAPTER 1

PESTS AND PEST CONTROL

POST TEST

Answer the following questions true or false:

1. Fungi, nematodes, viruses and bacteria may cause plant diseases.

   A. true
   B. false

2. Air pollution may cause plant disease.

   A. true
   B. false

3. Annual weeds produce seed in the second year of growth.

   A. true
   B. false

4. A corn plant growing in a tobacco field can be called a weed.

   A. true
   B. false

5. If pests are present they should be killed whether or not they are causing any damage.

   A. true
   B. false

6. Frogs might be considered as pests.

   A. true
   B. false

7. Plant diseases can be caused by non-living agents.

   A. true
   B. false

8. Spiders are not insects.

   A. true
   B. false

9. Most insects have the same type of mouth parts.

   A. true
   B. false

10. *Any* plant can be a weed.

    A. true
    B. false

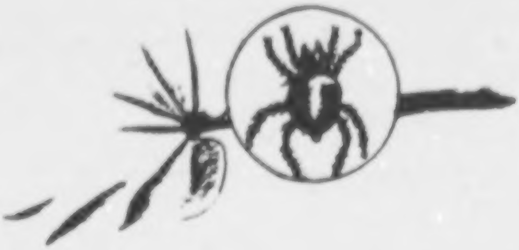
11. Incomplete development of a plant's flowers can be an indication of plant disease.

A. true
B. false

Answer the following multiple choice questions:

12. The animal shown here:

A. is an insect.
B. is a mite.
C. Both of these.



13. If you are trying to tell one insect from another, the most important things to look at are the:

A. wings and mouth parts.
B. body size and shape.
C. color and body markings.
D. legs and abdomen.

14. Insect pests can:

A. feed on and tunnel in roots.
B. carry plant disease agents.
C. feed on and in seeds and nuts.
D. All of these.

15. Which of these are possible pests?

A. dogs.
B. weeds
C. viruses
D. All of these.

16. What do you call plants that live for 2 years?

A. annuals.
B. perennials.
C. biennials.
D. winter annuals.

17. A tree is an example of:

A. an annual.
B. a biennial.
C. a perennial.
D. a semi-annual.

18. Match the following:

A. Fungi: _____
B. Nematode: _____
C. Bacteria: _____
D. Viruses: _____

1. Cause rots and scabs.
2. Cause blights, wilts and scabs.
3. Cause mosaic disease.
4. Cause root cysts and knots.

19. Match the following:

A. Summer annual: _____
B. Winter annual: _____
C. Biennial: _____
D. Perennial: _____

1. Sprouts in the spring and lives for year or less.
2. Sprouts in the fall and lives for year or less.
3. Lives through two (2) growing seasons.
4. Lives for several years or indefinitely.

Answer the following questions by filling in the blanks:

20. Name five (5) techniques of pest control without using pesticides:

A. Plant _____ resistant varieties.
B. Use good _____ management.
C. Destroy _____ residues.
D. Clean _____ and cultivation.
E. Encourage pests natural _____.

21. Insects have _____ legs.

22. Insect bodies have _____ regions.

23. A _____ is a plant out of place.

24. Spiders have _____ legs.

25. Winter annuals sprout in the _____.

CHAPTER 2

PESTICIDES

PRE TEST

Answer the following questions true or false:

1. A pest attractant is classified as a pesticide.

   A. true
   B. false

2. Plant growth regulators can both speed up and slow down plant growth.

   A. true
   B. false

3. A translocated herbicide must contact the whole plant in order to kill it.

   A. true
   B. false

4. A foliar pesticide treatment is made to the leaves of plants.

   A. true
   B. false

5. A defoliant can be used as a harvest aid.

   A. true
   B. false

6. A chemical that kills most animals coming in contact with it is highly selective.

   A. true
   B. false

7. A dip is like a pesticide bath.

   A. true
   B. false

8. An ultra low volume solution may be 100% pesticide.

   A. true
   B. false

9. Wettable powders dissolve in water the same way sugar or salt does.

   A. true
   B. false

10. Liquefied gases are used as fumigants.

    A. true
    B. false

Answer the following multiple choice questions:

11. Preemergence refers to the time:

    A. just before crops are planted.
    B. after crops have been planted, but before plants or weeds emerge.
    C. after crops and weeds emerge from the ground but before harvest.

12. Mites are killed by:

    A. insecticides.
    B. miticides.
    C. acaricides.
    D. All of these.

13. An antitranspirant is designed to:

    A. kill plants.
    B. kill only certain weeds.
    C. make plants drop their leaves by drying them out.
    D. prevent water loss by coating plant leaves.

14. A piscicide would be used to kill:

    A. "trash" fish.
    B. blackbirds.
    C. nematodes.
    D. pickle worms.

15. Slugs and snails are chemically controlled by:

    A. avicides.
    B. acaricides.
    C. molluscicides.
    D. predacides.

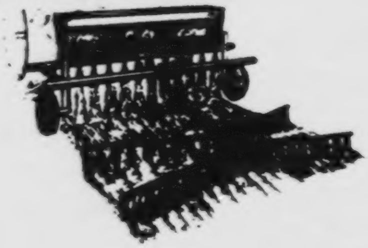
16. Which of these will kill some kinds of plants and cause little or no injury to others?

    A. translocated herbicide.
    B. selective herbicide.
    C. contact herbicide.
    D. non-selective herbicide.

17. Systemics:

    A. kill insects feeding on the sap of plants treated with the chemical.
    B. kill on contact.
    C. kill when inhaled by pest animals.
    D. kill weed plants when it enters through the plant roots.

18. What pesticide application method is shown in this picture?



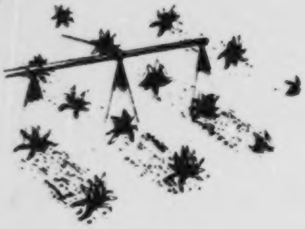
    A. band.
    B. directed.
    C. soil incorporation.
    D. sidedress.

19. A spray that kills insects when they touch it is called:

A. a contact insecticide.
B. a stomach poison.
C. a fumigant.
D. a desiccant.

20. What pesticide application method is shown here?

A. broadcast.
B. drench.
C. band.
D. in-furrow.



21. Match the following:

A. Drench: ________
B. Sidedress: ________
C. Spot treatment: ________
D. In-furrow: ________
E. Directed: ________
F. Pour-on: ________
G. Broadcast: ________
H. Over-the-top: ________

1. Uniform application to an area.
2. Poured on back of livestock.
3. Application along side of crop row.
4. Either saturation of soil with pesticide or application of liquid pesticide to mouth of animal.
5. Application over top of growing crop.
6. Application in the furrow of planted crops.
7. Aim pesticide at part of plant or animal.
8. Application of pesticide to small area.

22. Match the following:

A. Dusts: ________
B. Granules: ________
C. Wettable powders: ________
D. Soluble powders: ________
E. Baits: ________
F. Emulsifiable concentrate: ________
G. Solutions: ________
H. Flowables: ________
I. Aerosols: ________

1. Used to mist inside of barn.
2. Inert ingredient might be corn.
3. Must be constantly agitated in spray tank to keep suspension.
4. Liquid formulation that forms an emulsion in water.
5. Liquid formulation that forms a suspension in water.
6. Dry formulation that dissolves in water.
7. Liquid formulation that can be used straight from the can on livestock.
8. Dry formulation made with fine powder as inert ingredient.
9. Dry formulation made with coarse particles.

23. Fill in the blanks:

________________ ingredients + ________________ ingredients = pesticide formulation.

CHAPTER 2

PESTICIDES

LEARNING PROGRAM

1. When non-chemical methods fail to control pests, and when pests are doing an unacceptable amount of damage, then pesticides should be used.

   This chapter will cover types of pesticides and how they work.

   GO ON TO THE NEXT FRAME

---

2. "Cide" means killing. A homicide involves the ________________ of a person.

---

3. Roughly speaking, the word "pesti*cide*" refers to the ________________ of pests.

---

4. Pesticides are chemicals used to *control* pests. This may involve killing them. Because of Government regulations, the following are also classed as pesticides:

   - Chemicals used to attract or repel pests.
   - Chemicals used to regulate plant growth.
   - Chemicals used to remove plant leaves.
   - Chemicals used to coat plant leaves.

   A chemical used to make plants drop their leaves (is/is not) classified as a pesticide.

---

5. An *attractant* is a pesticide that is used to ________________ pests (possible so that they can be destroyed or captured).

   A *repellant* is a pesticide that keeps ________________ away.

---

6. Foliage refers to plant leaves.

   A *defoliant* is a pesticide that makes plants:

   A. Grow bigger.
   B. Drop their leaves.

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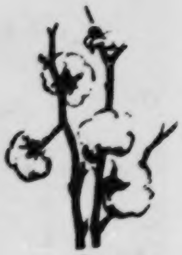
7. A desiccant acts to kill leaves. It makes plants dry up. This:

A. Increases plant foliage.
B. Destroys the plant's leaves and stems.

---

8. Desiccants and defoliants are not always used on pest plants. They can be used to remove leaves and stems to aid in the harvesting of crops such as potatoes, soybeans and cotton. The cotton shown in which picture would be easier to harvest?

A.

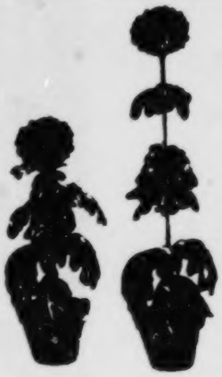

B.

---

9. A plant growth regulator is another chemical classified as a pesticide, even though it may not be used on pest plants. This chemical can speed up, slow down, stop, or otherwise change normal plant functioning.

If you wanted to speed up the growth of seedlings you would use a:

A. Plant growth regulator.
B. Desiccant or defoliant.
C. Both of these.



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10. When humans lose moisture through the pores in their skin, it is called perspiration.

Plants lose water through pores in their leaves. This is called *transpiration.*

If plant leaves were coated so that these pores were covered, transpiration would (increase/decrease).

---

11. An *antitranspirant* is a chemical that coats plant leaves. This (increases/reduces) water loss.

[redacted]

12. Again, because of their chemical nature, antitranspirants are classified as pesticides.

The purpose of antitranspirants is to:

A. Lower water loss from transpiration.
B. Kill plants.

---

13. Which of these is classified as a pesticide?

A. Plant growth regulators.
B. Pest attractants and repellants.
C. Antitranspirants.
D. All of these.

---

14. Match these:

A. Attractant: ______
B. Repellant: ______
C. Desiccant and defoliant: ______
D. Plant growth regulator: ______
E. Antitranspirant: ______

1. Used to remove leaves and stems.
2. Changes the rate of plant growth.
3. Keeps pests away.
4. Reduces plant water loss.
5. Lures pests.

---

15. Some pesticides act in such a way that they will kill a large variety of plants or animals. These are *non-selective* pesticides.

Other pesticides are *selective*—they kill only specific types of plants or animals.

A pesticide that kills grass but not corn is (selective/non-selective).

---

16. A chemical that kills most animals coming in contact with it is a (selective/non-selective) pesticide.

---

17. Exhibit I in the back of this chapter lists different types of pesticides and what they control.

Read them through before answering the following questions.

Refer back to the Exhibit to help you find the correct answers.

GO ON TO THE NEXT FRAME

---

18. Which pesticide would be used to control fungus?

______________cide.

19. Which pesticide would be used to control small rodents such as rats or mice?

_______________cide.

---

20. The word "herb" refers to plants. What pesticide would be used to kill plants?

____

---

21. The word "avis" means bird in Latin.

An avicide would be used to control:

A. Blackbirds.
B. Spiders.
C. Rats.
D. All of these.

---

22. Mollusks are animals like snails, slugs, clams, etc.

To kill land snails that may be damaging melons you would use a _______________.

---

23. According to Exhibit I, what type of pesticide would be used on mites, ticks and spiders?

____

---

24. Actually, mites, ticks and spiders are closely related to insects. Check Exhibit I again.

Can some insecticides be used to kill mites, ticks and spiders? (yes/no)

---

25. Which of these could be used to kill mites?

A. Miticide.
B. Insecticide.
C. Acaricide.
D. All of these.

---

26. "Piscus" in Latin means fish.

Which pesticide could be used on pest fish?

____

27. Match the following:

A. Miticide: ______
B. Nematicide: ______
C. Bactericide: ______
D. Predacide: ______

1. Controls nematodes.
2. Controls predators or other pest animals.
3. Controls bacteria.
4. Controls mites.

HOW PESTICIDES WORK

28. Pesticides work in a variety of ways. One type of pesticide works on *contact*. It kills the pest when the pest touches the pesticide.

Another type of pesticide works when it is swallowed. This is a *stomach poison.*

A bait for killing rats is:

A. A contact pesticide.
B. A stomach poison.

---

29. A pesticide used to kill crawling insects would more likely be:

A. A contact pesticide.
B. A stomach poison.

---

30. A systemic is a pesticide that is fed into a plant's or animal's system.

The systemic pesticide makes the blood or sap poisonous to the pest feeding on it.

The systemic pesticide must be (selective/non-selective).

---

31. A plant is treated with a chemical that makes its sap poisonous to insects feeding on its leaves and stems. This is an example of a:

A. Systemic pesticide.
B. Contact pesticide.

---

32. "Trans" means to "move". The word "translocated" means to "move location". Some herbicides enter the plant through one part and spread through the whole plant. This entry might come by way of the leaves, roots, or some other part of the plant.

These are called *translocated herbicides.*

A translocated herbicide:

A. Stays in one part of the plant.
B. Moves throughout the plant.

33. A translocated herbicide:

A. Must contact the whole plant to kill it.
B. Need only contact part of the plant to kill it.

34. A fumigant is a pesticide that turns to a gas before it kills pests.

A fumigant works:

A. Only if it is eaten.
B. When it is inhaled or absorbed.

35. Match these:

A. Contacts: ______
B. Stomach poisons: ______
C. Translocated herbicides: ______
D. Fumigants: ______
E. Systemics: ______

1. Kills pests feeding on sap made poisonous.
2. Is absorbed on plant leaves and travels to other plant parts.
3. Turns to a gas.
4. Must be eaten to kill.
5. Kills when pest touches it.

WHEN TO USE PESTICIDES

36. There are different times in a growing season when pesticides are to be applied

For control of some summer annual weeds, a field should be treated *before* planting the crop.

GO ON TO THE NEXT FRAME

37. "Pre" means "before". Using a pesticide at preplanting means that the pesticide is used ______________ planting.

38. Preemergence is when a pesticide is used (before/after) plants and weeds appear.

39. "Post" means "after".

Match these:

A. Preplant: ______
B. Preemergence: ______
C. Postemergence: ______

1. Use after crops and weeds have emerged.
2. Use before crops or weeds have emerged.
3. Use before crop has been planted.

[redacted]

HOW TO USE PESTICIDES

40. Exhibit 2 in the back of this Chapter lists some of the ways pesticides can be applied.

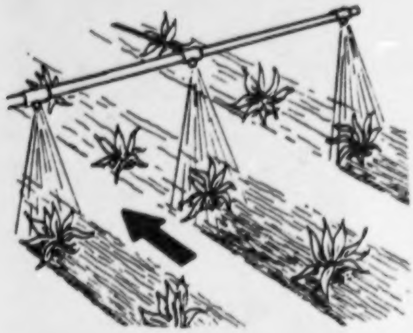
Read these over and answer the following questions. Refer back to Exhibit 2 when necessary.

GO ON TO THE NEXT FRAME

---

41. What application method is shown in the picture below?

A. Band.
B. Broadcast.
C. Pour on.



---

42. Broadcast application would be directed to:

A. Specific plants.
B. Covering an acre uniformly.
C. Covering only a row of plants.

---

43. Cattle can be immersed in a pesticide bath to kill mites or ticks. This method is called:

A. Sidedress.
B. Dip.
C. Spot treatment.

---

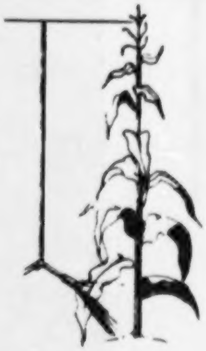
44. Pouring a pesticide along the midline of the backs of cattle is called:

A. Pour on.
B. Foliar.
C. Drench.

---

45. The picture here shows what application *method?*

A. Directed.
B. In-furrow.
C. Sidedress.



[redacted]

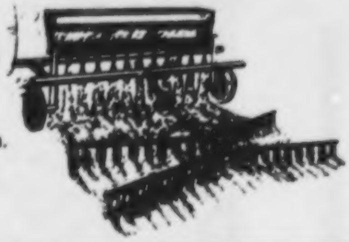
46. Spraying a pesticide on top of a growing plant is called:

A. Drench.
B. Over-the-top.

---

47. The picture shows:

A. Spot treatment.
B. Drench.
C. Broadcast soil incorporation.



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48. Drench application of a pesticide could refer to two (2) different situations. Check Exhibit 2 again.

Drench application means:

A. Saturating or soaking the soil with pesticide.
B. Treating an animal by mouth with liquid pesticide.
C. Both of these.

---

49. What is the application along the side of a crop row called?

____

---

50. Foliage refers to the leaves of a plant.

What is the application of pesticide to the leaves of a plant called?

_______________ application.

---

51. An in-furrow application of pesticide is made in or to the _______________ in which the plant has been planted.

---

52. An application of pesticide to a small area is called _______________ treatment.

---

53. Match the following:

A. Dip: ______
B. Foliar: ______
C. Drench: ______
D. Broadcast: ______
E. Sidedress: ______
F. Pour on: ______

1. Uniform application to an entire specific area.
2. Immersion or bath in the pesticide.
3. Application to leaves.
4. Poured on back of livestock.
5. Application along side of crop row.
6. Either saturation of soil with pesticide or application of liquid pesticide to mouth of cattle.

[redacted]

54. Match the following:

A. Band: ______
B. Directed: ______
C. In-furrow: ______
D. Over-the-top: ______
E. Soil incorporation: ______
F. Spot treatment: ______

1. Application over the top of growing crop.
2. Application in the furrow in which a plant is planted.
3. Mixed with the soil.
4. Application to small area.
5. Application to strip along row of plants.
6. Aim pesticide at part of plant or animal.

TYPES OF PESTICIDE FORMULATIONS

55. Pesticides are rarely applied full strength. Usually the pesticide is mixed with another ingredient.

The chemical that does the work in a pesticide formulation is the ______________ ingredient.

Active ingredients
(the chemicals that do the work)
+
Inert ingredients
(make the product easier to apply)
=
Pesticide formulation

---

56. The inert ingredient in the formulation:

A. Kills pests.
B. Helps in applying the pesticide.

---

57. Fill in the blanks:

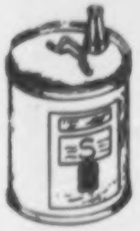
______________ ingredients + ______________ ingredients = pesticide formulation.

---

58. Pesticide formulations can be liquid or dry. We will consider the liquid formulations first.

In a liquid formulation, the active ingredient is mixed with a ______________.

59. One type of liquid formulation is the *solution* (S).



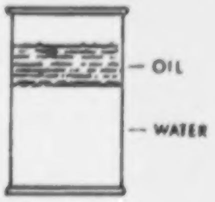
Solutions are ready to use straight from the container. They are often used on livestock and in barns.

Do solutions *have* to be mixed with anything else? (yes/no)

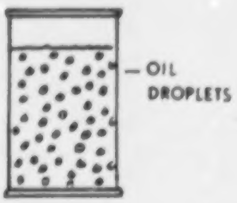
---

60. An emulsion is a mixture of two (2) liquids, where one liquid is broken up into tiny drops in the other liquid. An example of this is oil and water. If soap is added to the mixture, the oil can be broken up and mixed with the water.

Which picture shows an emulsion?



A.



B.

---

61. An *emulsifiable concentrate* (EC or E) comes in the form of an oily liquid. Since it is concentrated, it is mixed with water to form an emulsion. This emulsion is then applied with a sprayer.

An emulsifiable concentrate is used:

A. Mixed with water.
B. Full strength from the container.

---

62. A *flowable* (F or L) can also be mixed with water for use in a sprayer. The flowable liquid forms a suspension in the water.

Which of these is ready to use straight from the container:

A. Emulsifiable concentrate.
B. Flowable.
C. Solution.
D. All of these.

[redacted]

63. The ***ultra low volume solution*** (ULV) is a highly concentrated formulation. In fact, it may contain the active ingredient alone. Ultra low volume solutions require special equipment to apply them.

Ultra low volume solutions (ULV) are ____________ concentrated formulations and are applied with ____________ equipment.

---

64. ***Aerosols*** (A) are low concentrate solutions, usually applied as a fine spray or mist indoors. Some are sold in pressurized cans.

Which is a more likely application of aerosols?

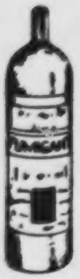
A. Spray corn for ear worms.
B. Spray barns for flying insects.

---

65. ***Liquefied gases*** turn into gases when they are used.

Liquefied gases are used:

A. As fumigants.
B. As sprays.



---

66. Which of the following may come in a pressurized container?

A. Solution.
B. Liquefied gas.
C. Flowable.

---

67. Which of the following formulations may be active ingredient only?

A. Ultra low volume solutions.
B. Solutions.
C. Aerosols.

---

68. Which of the following should be mixed with water before using?

A. Solutions.
B. Flowables.
C. Aerosols.
D. All of these.

---

69. Which of these is ready to use from the container?

A. Solutions.
B. Flowables.
C. Emulsifiable concentrates.
D. None of these.

DRY FORMULATIONS

70. Dry formulations come in a solid or powdery form. Some are made to be mixed with water.

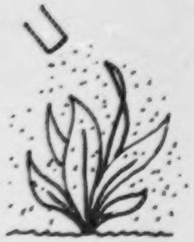
Dry formulations are used:

A. Dry, as they come from the package.
B. Mixed with water.
C. Either dry or mixed with water.

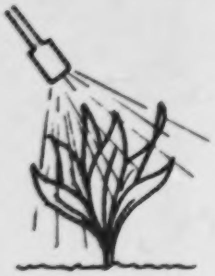
---

71. *Dusts* (D) are made by adding the active ingredient to a fine, inert powder. The dust is put on dry.

Which picture shows dust being applied?



A.

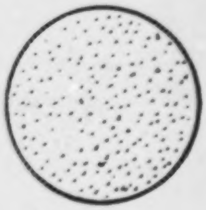


B.

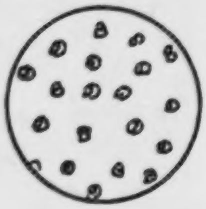
---

72. *Granules* (G) are made by mixing the active ingredient with coarse particles of some inert material.

Which picture shows an enlargement of granules?



A.



B.

---

73. Granules may be used like dusts.

Granules are:

A. Applied dry.
B. Mixed with water.

---

74. *Soluble powders* (SP) are made to dissolve in water. The solution is then applied to crops.

Soluble powders are:

A. Sprayed on crops.
B. Dusted on crops.

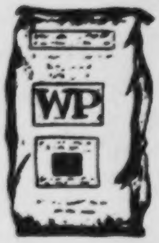
75. Wettable powders (W or WP) are also made to mix with water, but they do not dissolve in the water. Instead, they form a suspension (a little like a mixture of fine flour and water).

Wettable powders:

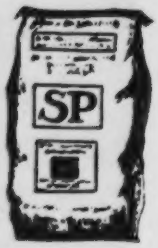
A. Stay mixed with water.
B. Will settle out of water unless they are constantly stirred or agitated.

---

76. Which of these must be agitated as it is applied?



A.



B.

---

77. Poisonous baits are another dry formulation. These are made by mixing an active ingredient with some type of food or other attractive substance.

The inert ingredient in poisonous baits for rats could be:

A. The pesticide.
B. Raw meat.

---

78. Match these:

A. Dusts: ______
B. Granules: ______
C. Wettable powders: ______
D. Soluble powders: ______
E. Baits: ______

1. Dissolves in water.
2. Mix with water to form a suspension.
3. Fine powder applied dry.
4. Coarse particles.
5. Food is the inert ingredient.

---

79. Match these:

A. Emulsifiable concentrates: ______
B. Ultra low volume solutions: ______
C. Solutions: ______
D. Flowables: ______
E. Aerosols: ______
F. Liquified gases: ______

1. Mixed with water to form suspension.
2. Ready to use from container.
3. Forms emulsion with water.
4. Applied as a mist indoors.
5. Fumigant.
6. Highly concentrated and requires special application equipment.

[redacted]

REVIEW AND SUMMARY

80. Which of these is classed as a pesticide?

- A. Rodenticides.
- B. Pest attractants.
- C. Antitranspirants.
- D. All of these.

81. An antitranspirant is used to prevent ______________ loss in plants.

82. Desiccants and defoliants are used to remove plant ______________ .

83. A non-selective pesticide kills:

- A. Only one specific pest.
- B. Many kinds of plant or animal life.

84. Which of these is used to control fish?

- A. Acaricide.
- B. Herbicide.
- C. Avicide.
- D. Piscicide.

85. Which of these kill pests by making blood or sap of a living host poisonous to the pest?

- A. Contact pesticide.
- B. Translocated herbicide.
- C. Systemics.
- D. Fumigant.

86. The postemergence application of a herbicide to kill weeds occurs (before/after) the weeds have appeared.

87. If the soil is saturated with an insecticide, this is called:

- A. Drench.
- B. Foliar.
- C. Dip.
- D. Directed.

88. Which of these is also called drench treatment?

- A. Aiming the pesticide at a portion of a plant.
- B. Pouring the pesticide along the mid-line of the back of livestock.
- C. Oral treatment of an animal with a liquid pesticide.

[redacted]

89. Pesticide formulations come in the form of:

ACTIVE INGREDIENTS + ______________ INGREDIENTS

You have just completed Chapter 2, Pesticides. Now complete the Post Test found in the back of this Chapter.

CHAPTER 2

PESTICIDES

POST TEST

Answer the following questions true or false:

1. A pest attractant is classified as a pesticide.

   A. true
   B. false

2. Plant growth regulators can both speed up and slow down plant growth.

   A. true
   B. false

3. A translocated herbicide must contact the whole plant in order to kill it.

   A. true
   B. false

4. A foliar pesticide treatment is made to the leaves of plants.

   A. true
   B. false

5. A defoliant can be used as a harvest aid.

   A. true
   B. false

6. A chemical that kills most animals coming in contact with it is highly selective.

   A. true
   B. false

7. A dip is like a pesticide bath.

   A. true
   B. false

8. An ultra low volume solution may be 100% pesticide.

   A. true
   B. false

9. Wettable powders dissolve in water the same way sugar or salt does.

   A. true
   B. false

10. Liquefied gases are used as fumigants.

    A. true
    B. false

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Answer the following multiple choice questions:

11. Preemergence refers to the time:

    A. just before crops are planted.
    B. after crops have been planted, but before plants or weeds emerge.
    C. after crops and weeds emerge from the ground but before harvest.

12. Mites are killed by:

    A. insecticides.
    B. miticides.
    C. acaricides.
    D. All of these.

13. An antitranspirant is designed to:

    A. kill plants.
    B. kill only certain weeds.
    C. make plants drop their leaves by drying them out.
    D. prevent water loss by coating plant leaves.

14. A piscicide would be used to kill:

    A. "trash" fish.
    B. blackbirds.
    C. nematodes.
    D. pickle worms.

15. Slugs and snails are chemically controlled by:

    A. avicides.
    B. acaricides.
    C. molluscicides.
    D. predacides.

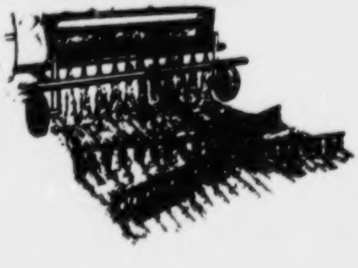
16. Which of these will kill some kinds of plants and cause little or no injury to others?

    A. translocated herbicide.
    B. selective herbicide.
    C. contact herbicide.
    D. non-selective herbicide.

17. Systemics:

    A. kill insects feeding on the sap of plants treated with the chemical.
    B. kill on contact.
    C. kill when inhaled by pest animals.
    D. kill weed plants when it enters through the plant roots.

18. What pesticide application method is shown in this picture?

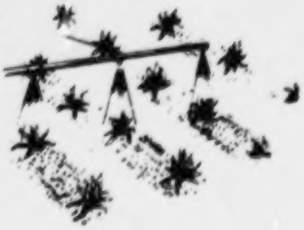


    A. band.
    B. directed.
    C. soil incorporation.
    D. sidedress.

19. A spray that kills insects when they touch it is called:

A. a contact insecticide.
B. a stomach poison.
C. a fumigant.
D. a desiccant.

20. What pesticide application method is shown here?



A. broadcast.
B. drench.
C. band.
D. in-furrow.

21. Match the following:

A. Drench: ________
B. Sidedress: ________
C. Spot treatment: ________
D. In-furrow: ________
E. Directed: ________
F. Pour-on: ________
G. Broadcast: ________
H. Over-the-top: ________

1. Uniform application to an area.
2. Poured on back of livestock.
3. Application along side of crop row.
4. Either saturation of soil with pesticide or application of liquid pesticide to mouth of animal.
5. Application over top of growing crop.
6. Application in the furrow of planted crops.
7. Aim pesticide at part of plant or animal.
8. Application of pesticide to small area.

22. Match the following:

A. Dusts: ________
B. Granules: ________
C. Wettable powders: ________
D. Soluble powders: ________
E. Baits: ________
F. Emulsifiable concentrate: ________
G. Solutions: ________
H. Flowables: ________
I. Aerosols: ________

1. Used to mist inside of barn.
2. Inert ingredient might be corn.
3. Must be constantly agitated in spray tank to keep suspension.
4. Liquid formulation that forms an emulsion in water.
5. Liquid formulation that forms a suspension in water.
6. Dry formulation that dissolves in water.
7. Liquid formulation that can be used straight from the can on livestock.
8. Dry formulation made with fine powder as inert ingredient.
9. Dry formulation made with coarse particles.

23. Fill in the blanks:

________________ ingredients + ________________ ingredients = pesticide formulation.

PESTICIDES

Here are the types and uses of the most common pesticides:

Insecticide: controls insects and other related pests such as ticks and spiders.

Miticide: controls mites.

Acaricide: controls mites, ticks and spiders.

Nematicide: controls nematodes.

Fungicide: controls fungi.

Bactericide: controls bacteria.

Herbicide: controls weeds.

Rodenticide: controls rodents.

Avicide: controls birds.

Piscicide: controls fish.

Molluscicide: controls mollusks, such as slugs and snails.

Predacide: controls pest animals.

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CHAPTER 2, EXHIBIT 2

Band: application to a strip or band over or along each crop row.

Broadcast: uniform application to an entire, specific area.

Dip: complete or partial immersion of a plant, animal, or object in a pesticide.

Directed: aiming the pesticide at a portion of a plant, animal, or structure.

Drench: saturating the soil with a pesticide; oral treatment of an animal with a liquid pesticide.

Foliar: application to the leaves of a plant.

In-furrow: application to or in the furrow in which a plant is planted.

Over-the-top: application over the top of the growing crop.

Pour-on: pouring the pesticide along the midline of the back of livestock.

Sidedress: application along the side of a crop row.

Soil incorporation: application to the soil followed by use of tillage implements to mix the pesticide with the soil.

Spot treatment: application to a small area.

CHAPTER 3

LABELS AND LABELING

PRE TEST

1. The *labeling* for a pesticide includes only the information found on the pesticide label.

   A. true
   B. false

2. Using Exhibit 2, fill in the following:

   The *product name* shown on this label is ______________.
   The *common name* for the active ingredient is ______________.
   The *chemical name* is ______________.
   The *net contents* are ______________.
   The *name and address* of the manufacturer is ______________.

3. The *ingredient statement* on a label must contain:

   A. the names of the active ingredient(s) and their amount.
   B. the *names* of the inert ingredients.
   C. the amount of inert ingredients.
   D. A and C above.

4. The *EPA registration number* on this label tells you:

   A. that EPA registered the product.
   B. That the product can be legally sold.
   C. the factory that made the chemical.

5. The EPA establishment number on a product:

   A. identifies the factory that made the product.
   B. tells you where the product was made.
   C. Both of the above.

6. Match the following:

   A. CAUTION
   B. WARNING
   C. DANGER

   1. Moderately toxic
   2. Highly toxic
   3. Low order toxicity

7. Which of the following will be listed on a pesticide label?

   A. Environmental hazards
   B. Physical or chemical hazards
   C. KEEP OUT OF REACH OF CHILDREN
   D. All of the above.

8. The *REENTRY STATEMENT* on the pesticide label tells you what?

   Answer ______________________________

9. The *DIRECTIONS FOR USE* will tell you what pests the pesticide will control and what crops the pesticide can be used on.

   A. true
   B. false

10. Assume that you have been poisoned by a pesticide. The *first* source of information and instructions for first aid should come from:

    A. a doctor.
    B. the pesticide label.
    C. a reference book on poisons.
    D. the local pesticide dealer.

11. Look at Exhibit 2 again.

    An empty container of DEPESTO should be disposed of by ________________.

    DEPESTO is limited to application by ________________ applicators.

    DEPESTO is a ________________ use pesticide.

    It is a violation of ________________ to use this pesticide in a manner inconsistent with its labeling.

CHAPTER 3

LABELS AND LABELING

LEARNING PROGRAM

1. Pesticides are required by law to be properly labeled. Certain information must appear on the label in specific places.

   This chapter will cover the organization of the pesticide label and explain the information found on the label.

   GO ON TO THE NEXT FRAME

---

2. There are 2 Exhibits that will be used for this chapter.

   Exhibit 1 is a model outline label. It does not contain any specific information.

   Exhibit 2 is a sample label with made-up information. *This is not a real label.*

   Refer to these 2 exhibits as you go through this chapter.

   GO ON TO THE NEXT FRAME

---

3. When you buy a pesticide, you will receive instructions on how it should be used. These instructions will be found on: (1) the label attached to the container, (2) brochures and flyers put out by the manufacturer, or (3) printed information handed out by your dealer.

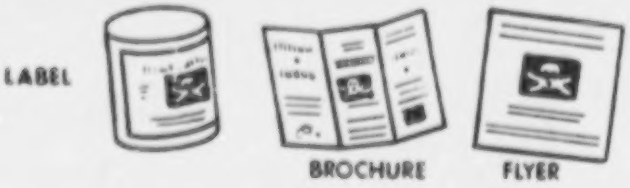
   Information on how to use a pesticide:

   A. is found *only* on the label.
   B. is given on the label and additional materials such as brochures and handouts.

B
is given on the label and additional materials such as brochures and handouts.

4. *All* of the printed instructions that come with the pesticide are part of the labeling.

Labeling includes:



A. the label on the container.
B. product brochures.
C. flyers.
D. All of the above.

D
All of the above.

5. The label is what is printed on or attached to a pesticide container. The remainder of this program will cover the parts of the label itself.

GO ON TO THE NEXT FRAME

---

6. The most prominent information to appear on the label is the "product name" of the pesticide. However, there may be several different names for the same pesticide.

Check Exhibit 1. This is the model label with no filled in information.

The largest name to appear on this label is the ______________ name.

---

product

7. Check Exhibit 2. This has sample (but made-up) information.

The product name of this pesticide is ______________.

DEPESTO

8. The product you buy is usually not purely a pesticide chemical but rather a mixture of several ingredients called a formulation.

Check Exhibit 1.

The ingredients of a pesticide formulation are broken down as ______________ ingredients and ______________ ingredients.

active
inert

9. The (active/inert) ingredients are the ones that do the work.

active

10. Active ingredients may be called by 2 different names.

First, the active ingredient will have a chemical name. Some chemicals are given a common name to make them easier to identify.

For example, the pesticide I-napthyl-N-methylcarbamate has an official common name, carbaryl. Which is the common name?

A. I-napthyl-N-methylcarbamate.
B. carbaryl.

B
carbaryl

11. The pesticide label shows both the common name and the chemical name of the active ingredient.

Refer to Exhibit 2. The common name for the active ingredient in this pesticide is:

A. DEPESTO.
B. pestoff.
C. tri-salicylic acid.

B
pestoff

12. The chemical name of the active ingredient is:

A. DEPESTO.
B. pestoff.
C. tri-slaicylic acid.

C
tri-salicylic acid

13. The purpose of the product name is to distinguish this product from others made by different manufacturers.

DEPESTO is:

A. a product name.
B. the name of the formulation, but not the active ingredient.
C. Both of these.

C
Both of these.

14. Match the following:

A. Product name ______
B. Common name ______
C. Chemical name ______

1. pestoff
2. tri-salicylic acid
3. DEPESTO

A 3
B 1
C 2

15. Check Exhibit 2.

Are the inert ingredients named? (yes/no)

---

no

16. The ingredient statement on the label also tells you the amount of active and inert ingredients there are in the formulation.

Check Exhibit 1.

These amounts are first given as a ______________ of active ingredient and a ______________ of inert ingredient.

---

percent
percent

17. What is the percent of active ingredient in Exhibit 2?

____

45.0%

18. Check Exhibit 1.

Below the ingredient statement is a statement that tells you how much active ingredient there is in a gallon of formulation.

This is given as ______________ per gallon.

---

19. According to the label in Exhibit 2, there are ______________ pounds of Pestoff per gallon of DEPESTO.

4.0

20. At the very bottom of the label is the net contents statement. This is given in pints, quarts, gallons, etc.

Circle the net contents statement on Exhibit 1.

21. On Exhibit 2 what is the net contents of this container?

- A. one pint.
- B. one quart.
- C. one gallon.

---

22. The law requires the manufacturer or distributor to have his name on the label so that you know who made or sold the product.

Check Exhibit 1 at the bottom of the label.

Is the manufacturer's address also required?

(yes/no)

---

23. According to the label in Exhibit 2, who is the manufacturer of DEPESTO?

____

A-Z Chemicals

24. Every pesticide product registered with the EPA has an EPA registration number assigned to it.

Which of these statements is true?

- A. Each can of DEPESTO has an EPA registration number.
- B. All cans of DEPESTO must carry the same EPA registration number and an EPA establishment number.
- C. Both A & B

C
Both A & B

25. The EPA registration number must appear on the label.

The EPA *establishment* number identifies the factory that made the chemical. It does not have to appear on the label, but it will be somewhere on each container.

The establishment number (is/is not) listed on Exhibit 1.

---

is
(It does not have to appear on the label but often does.)

26. Refer to Exhibit 2.

If you were asked for the EPA registration number for DEPESTO, what number would you give?

____

If you were asked for the EPA establishment number of DEPESTO, what number would you give?

____

EPA Registration No.
1387-42
EPA Establishment No.
00475

27. It is possible for two different cans of DEPESTO brand pestoff to have different (EPA registration/EPA establishment) numbers.

EPA registration

HUMAN HAZARD WARNINGS

28. One of the more obvious warnings on a pesticide label is the signal word.

According to Exhibit 1, you would expect this pesticide to be (highly/not too) toxic.

highly

29. The signal words on a label tell you how toxic or hazardous the product is to people. The following signal words have meanings fixed by law

DANGER WARNING CAUTION

Refer to Exhibit 1. Which word indicates the greatest hazard to humans?

A. DANGER
B. WARNING
C. CAUTION

A
DANGER

30. Match the following:

A. DANGER ______
B. WARNING ______
C. CAUTION ______

1. Moderately toxic
2. Highly toxic
3. Low order toxicity

A. 2
B. 1
C. 3

31. In addition, all products that carry the signal word DANGER must also carry the word POISON printed in red and the skull and crossbones symbol.

The skull and crossbones would be found with what signal word?

A. DANGER
B. WARNING
C. CAUTION

DANGER

32. According to Exhibit 2, DEPESTO has (high/moderate/low order) toxic.

[illegible]

33. Signal words are also associated with the amounts it would take to kill a person.

Signal Words	Toxicity	Approximate Amount Needed To Kill the Average Person
DANGER	Highly Toxic	A taste to a teaspoonful
WARNING	Moderately Toxic	A teaspoonful to a tablespoonful
CAUTION	Low-Order Toxicity	An ounce to more than a pint

For a pesticide labeled "WARNING", it would take approximately how much pesticide to cause a fatality?

A. teaspoonful B. at least an ounce or more

[illegible]

teaspoonful

34. Approximately how much of a highly toxic pesticide does it take to kill someone?

____

[illegible]

35. Could an average person be killed by a teaspoonful of DEPESTO? (yes/no)

[illegible]

36. *All pesticide labels must bear* the statement "KEEP OUT OF REACH OF CHILDREN".

This *child hazard statement* will appear on:

A. labels for highly toxic materials.
B. the labels on all pesticide containers.

B
the labels on all pesticide containers.

37. Under the signal word there is a STATEMENT OF PRACTICAL TREATMENT. Find this on the label in Exhibit 1.

The STATEMENT OF PRACTICAL TREATMENT tells you what to do:

A. to prevent poisoning.
B. in case of accidental poisoning.

B
in case of accidental poisoning.

38. Read the STATEMENT OF PRACTICAL TREATMENT on Exhibit 2.

If DEPESTO is swallowed, the victim should be made to:

A. lie down and rest.
B. vomit.

B
vomit

39. Additional information about hazards and poisoning can be found in the PRECAUTIONARY STATEMENTS section of the label.

Circle this section on Exhibit 1.

---

40. Check the PRECAUTIONARY STATEMENTS section on Exhibit 2.

Does this section give instructions to the doctor as to treatment of poisoning? (yes/no)

---

yes

41. A person is poisoned by swallowing some DEPESTO. After emergency first aid, he is rushed to the hospital. Information specifically for the doctor is found in:

A. the PRECAUTIONARY STATEMENTS section of the label.
B. the DIRECTIONS FOR USE section of the label.
C. the ingredients section.

A
the PRECAUTIONARY STATEMENTS section of the label.

42. The pesticide ____________ should be taken with the poison victim to the hospital.

label	43. The PRECAUTIONARY STATEMENTS section lists other dangers as well as those to humans or domestic animals. There are possible environmental hazards as well. These include threats to wildlife and to water supplies. Identify the following as an environmental or chemical hazard of DEPESTO: A. flammable (chemical/environmental) B. danger of drifting to non-target areas (chemical/environmental) C. may contaminate water with runoff (chemical/environmental)
A. chemical **B. environmental** **C. environmental**	44. Look at Exhibit 2. Is DEPESTO toxic to bees? (yes/no)
yes	DIRECTIONS FOR USE 45. Some of the things the DIRECTIONS FOR USE will tell you are: Pests the product will control. Crops or animals the product can be used on. How the product should be applied, and how much to use. Where and when the product should be applied. GO ON TO THE NEXT FRAME
	46. Check Exhibit 1. Note that directions are given: A. for all crops in one section. B. for each crop separately. C. Both of the above.
C **Both of the above.**	47. The DIRECTIONS FOR USE section of the DEPESTO label will tell you which of the following? How much DEPESTO to use per acre (yes/no) If DEPESTO can be used on corn (yes/no) If DEPESTO will be effective in controlling sugarcane borer (yes/no) How close to harvest time DEPESTO can safely be applied (yes/no)

48. According to Exhibit 2, DEPESTO can be used to control corn ______________.

---

49. Under DIRECTIONS FOR USE is a *misuse statement*, a ***REENTRY STATEMENT***, and a ***CATEGORY OF APPLICATOR*** statement.

The misuse statement will remind you that it is a violation of Federal Law to use the product inconsistent with its labeling.

The REENTRY STATEMENT tells you when it is safe to return to the treated area without protective clothing.

The CATEGORY OF APPLICATOR statement may limit use to certain kinds of applicators.

GO ON TO THE NEXT FRAME

---

50. According to the REENTRY STATEMENT on the DEPESTO label, it is safe to reenter the treated area after ______________ days.

According to the CATEGORY OF APPLICATOR statement, DEPESTO is limited for use to ______________ pest control applicators.

---

51. Below the CATEGORY OF APPLICATOR statement is a box called STORAGE AND DISPOSAL. Circle this in Exhibit 1.

---

52. Refer to the STORAGE AND DISPOSAL box for DEPESTO in Exhibit 2.

DEPESTO should not be stored near ______________, ______________ or ______________.

Once the DEPESTO has been used up, the empty container should be ______________ in a safe place.

53. Every pesticide label must show whether the contents are for general use or restricted use.

Refer to Exhibit 2.

DEPESTO is:

- A. a restricted use pesticide.
- B. a general use pesticide.

---

54. A restricted use pesticide can only be used by:

- A. a certified applicator, or someone he is supervising.
- B. professional pest control operators.

REVIEW AND SUMMARY

55. DEPESTO (is/is not) the name of a real pesticide.

---

56. What information on a pesticide label will be printed in the largest type and placed in a prominent position?

---

57. The product name is not usually the name of the primary ingredient in the container.

Information about the ingredients in the formulation is found immediately (over/under) the brand name.

---

58. A pesticide product usually contains (pure pesticide/pesticide plus inert ingredients).

pesticide plus inert ingredients	59. The pesticide label gives the product name, and the ingredients and the percentages. The label will usually tell you how much ____________ ingredient there is in one gallon of formulation.
active	60. The label also tells you: ____________ manufactured the product, the ____________ of the manufacturer, and the ____________ registration number.
who address EPA	61. The label also tells you in a prominent signal word the hazard warning that applies to the formulation. There are three levels of hazard and thus, three levels of warnings. A. DANGER B. WARNING C. CAUTION Which of the above is a warning for the most dangerous pesticide?
A DANGER	62. The area of the label that contains the human hazard warning also tells you the (emergency treatment/detailed instructions for a doctor) in case of pesticide poisoning.
emergency treatment	63. Every pesticide label must bear a statement that the pesticide must be kept out of the reach of ____________.
children	64. The pesticide label contains: PRECAUTIONARY STATEMENTS STORAGE AND DISPOSAL directions DIRECTIONS FOR USE DIRECTIONS FOR USE (are/are not) given for individual crops.

65. Would the **DIRECTIONS FOR USE** include the following information?

Name of specific crop. (yes/no)

---

66. Amount of product to use. (yes/no)

---

67. How to apply this product. (yes/no)

---

68. The label may also tell you who may use the pesticide. (yes/no)

You have just completed Chapter 3, Labels and Labeling. Now complete the post test at the back of this chapter.

CHAPTER 3
LABELS AND LABELING

POST TEST

1. The *labeling* for a pesticide includes only the information found on the pesticide label.

   A. true
   B. false

2. Using Exhibit 2, fill in the following:

   The *product name* shown on this label is ____________.
   The *common name* for the active ingredient is ____________.
   The *chemical name* is ____________.
   The *net contents* are ____________.
   The *name and address* of the manufacturer is ____________.

3. The *ingredient statement* on a label must contain:

   A. the names of the active ingredient(s) and their amount.
   B. the *names* of the inert ingredients.
   C. the amount of inert ingredients.
   D. A and C above.

4. The *EPA registration number* on this label tells you:

   A. that EPA registered the product.
   B. That the product can be legally sold.
   C. the factory that made the chemical.

5. The EPA establishment number on a product:

   A. identifies the factory that made the product.
   B. tells you where the product was made.
   C. Both of the above.

6. Match the following:

   A. CAUTION
   B. WARNING
   C. DANGER

   1. Moderately toxic
   2. Highly toxic
   3. Low order toxicity

7. Which of the following will be listed on a pesticide label?

   A. Environmental hazards
   B. Physical or chemical hazards
   C. KEEP OUT OF REACH OF CHILDREN
   D. All of the above.

8. The *REENTRY STATEMENT* on the pesticide label tells you what?

   Answer ________________________

Preceding page blank

9. The *DIRECTIONS FOR USE* will tell you what pests the pesticide will control and what crops the pesticide can be used on.

   A. true
   B. false

10. Assume that you have been poisoned by a pesticide. The *first* source of information and instructions for first aid should come from:

    A. a doctor
    B. the pesticide label.
    C. a reference book on poisons.
    D. the local pesticide dealer.

11. Look at Exhibit 2 again.

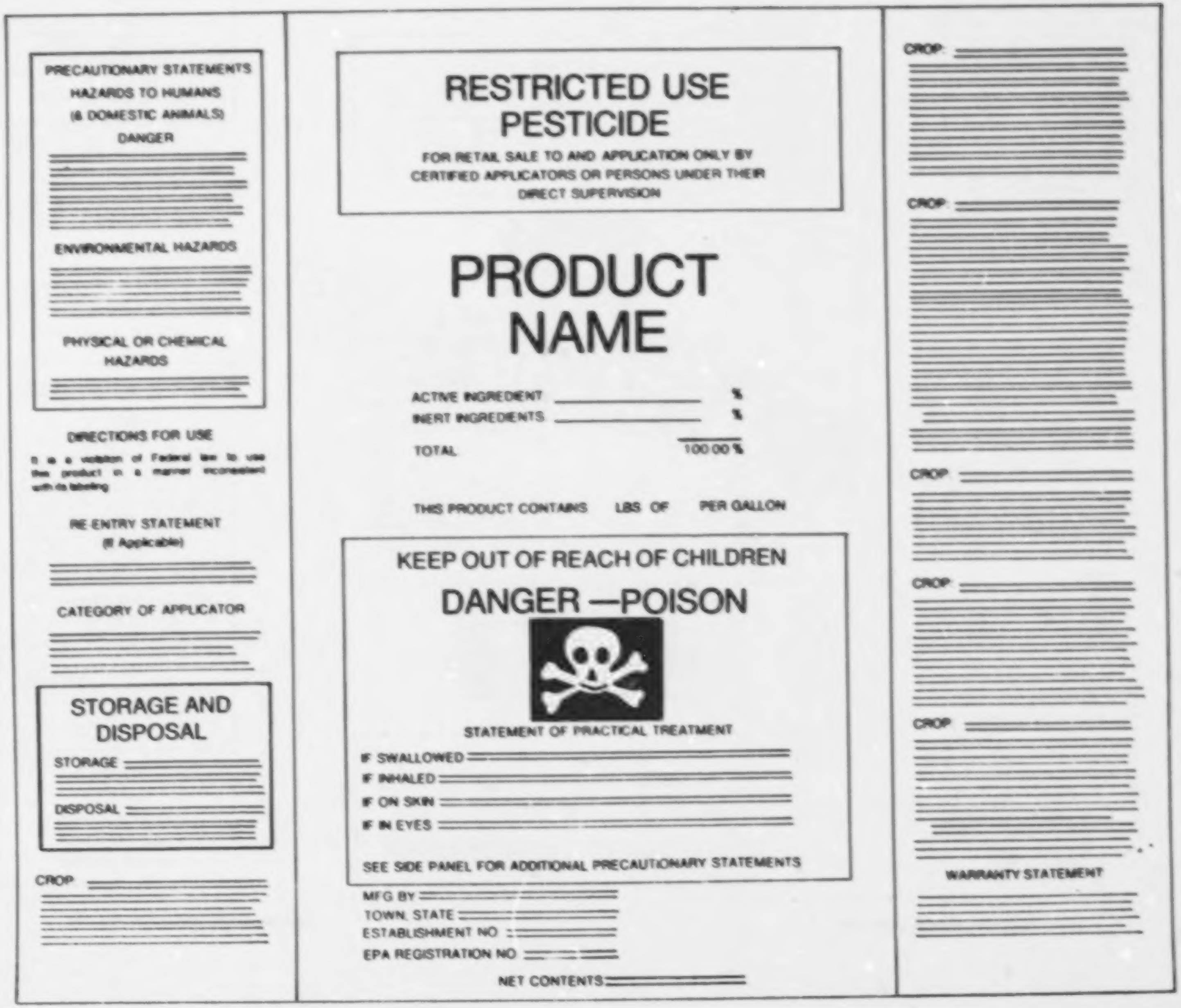
    An empty container of DEPESTO should be disposed of by ____________.

    DEPESTO is limited to application by ____________ applicators.

    DEPESTO is a ____________ use pesticide.

    It is a violation of ____________ to use this pesticide in a manner inconsistent with its labeling.

CHAPTER 3, EXHIBIT 1



PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS
(& DOMESTIC ANIMALS)
DANGER

ENVIRONMENTAL HAZARDS

PHYSICAL OR CHEMICAL HAZARDS

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling

RE-ENTRY STATEMENT
(If Applicable)

CATEGORY OF APPLICATOR

STORAGE AND DISPOSAL

STORAGE

DISPOSAL

CROP

RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION

PRODUCT NAME

ACTIVE INGREDIENT		%
INERT INGREDIENTS		%
TOTAL		100.00 %

THIS PRODUCT CONTAINS LBS OF PER GALLON

KEEP OUT OF REACH OF CHILDREN

DANGER —POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED
IF INHALED
IF ON SKIN
IF IN EYES

SEE SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MFG BY
TOWN, STATE
ESTABLISHMENT NO.
EPA REGISTRATION NO.

NET CONTENTS

CROP

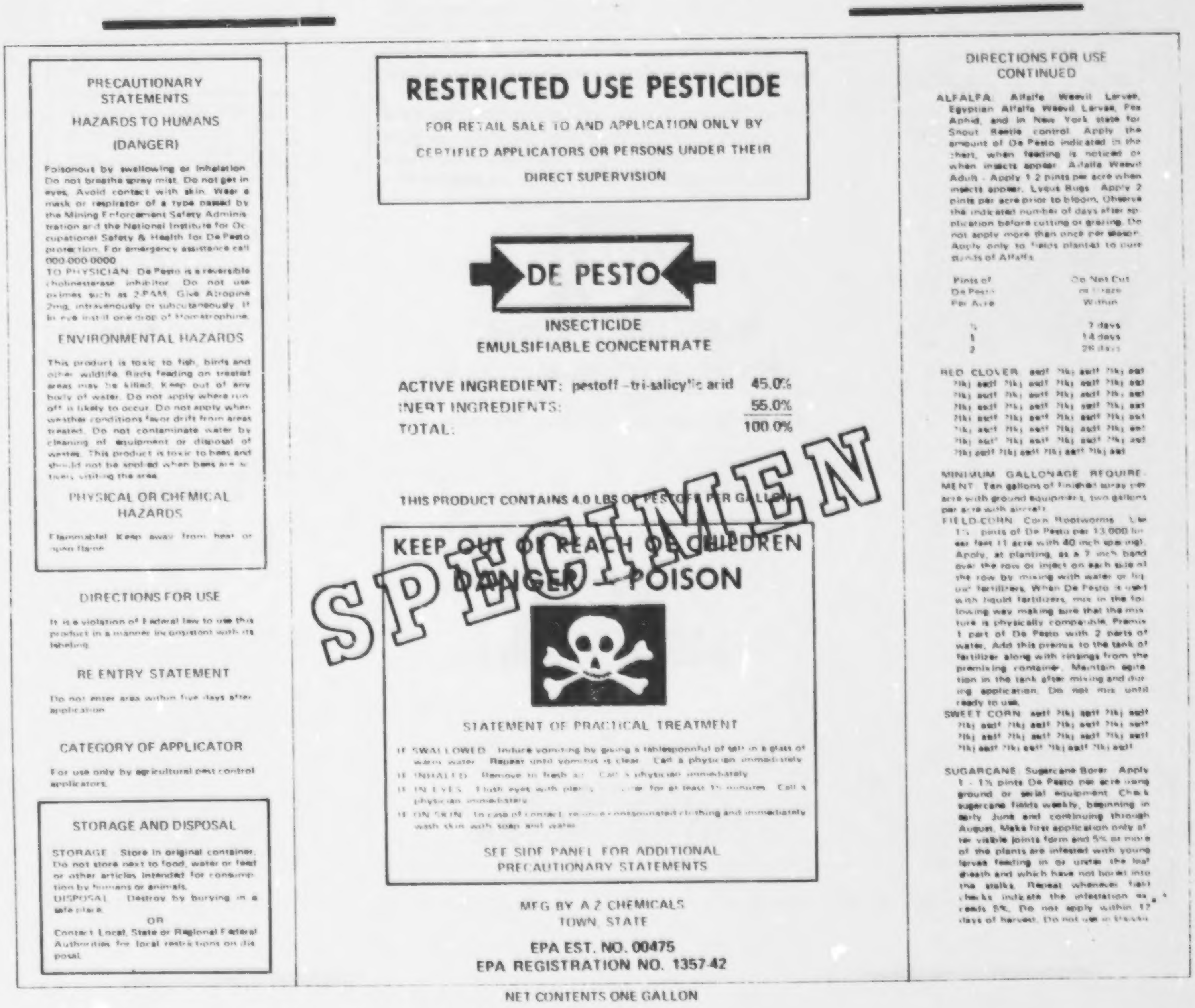
CROP

CROP

CROP

CROP

WARRANTY STATEMENT



SPECIMEN

PRECAUTIONARY
STATEMENTS

HAZARDS TO HUMANS

(DANGER)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Wear a mask or respirator of a type passed by the Mining Enforcement Safety Administration and the National Institute for Occupational Safety & Health for De Pesto protection. For emergency assistance call 000-000-0000

TO PHYSICIAN: De Pesto is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2mg. intravenously or subcutaneously. If in eye instill one drop of Homatrophine.

ENVIRONMENTAL HAZARDS

This product is toxic to fish, birds and other wildlife. Birds feeding on treated areas may be killed. Keep out of any body of water. Do not apply where run-off is likely to occur. Do not apply when weather conditions favor drift from areas treated. Do not contaminate water by cleaning of equipment or disposal of wastes. This product is toxic to bees and should not be applied when bees are actively visiting the area.

PHYSICAL OR CHEMICAL
HAZARDS

Flammable! Keep away from heat or open flame.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

RE-ENTRY STATEMENT

Do not enter area within five days after application.

CATEGORY OF APPLICATOR

For use only by agricultural pest control applicators.

STORAGE AND DISPOSAL

STORAGE: Store in original container. Do not store next to food, water or feed or other articles intended for consumption by humans or animals.

DISPOSAL: Destroy by burying in a safe place.

OR

Contact Local, State or Regional Federal Authorities for local restrictions on disposal.

RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY
CERTIFIED APPLICATORS OR PERSONS UNDER THEIR
DIRECT SUPERVISION

DE PESTO

INSECTICIDE
EMULSIFIABLE CONCENTRATE

ACTIVE INGREDIENT: pestoff—tri-salicylic acid	45.0%
INERT INGREDIENTS:	55.0%
TOTAL:	100.0%

THIS PRODUCT CONTAINS 4.0 LBS OF PESTOFF PER GALLON

KEEP OUT OF REACH OF CHILDREN
DANGER — POISON

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Induce vomiting by giving a tablespoonful of salt in a glass of warm water. Repeat until vomitus is clear. Call a physician immediately.

IF INHALED: Remove to fresh air. Call a physician immediately.

IF IN EYES: Flush eyes with plenty of water for at least 15 minutes. Call a physician immediately.

IF ON SKIN: In case of contact, remove contaminated clothing and immediately wash skin with soap and water.

SEE SIDE PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS

MFG BY A-Z CHEMICALS
TOWN, STATE

EPA EST. NO. 00475
EPA REGISTRATION NO. 1357-42

NET CONTENTS ONE GALLON

DIRECTIONS FOR USE
CONTINUED

ALFALFA: Alfalfa Weevil Larvae, Egyptian Alfalfa Weevil Larvae, Pea Aphid, and in New York state for Snout Beetle control. Apply the amount of De Pesto indicated in the chart, when feeding is noticed or when insects appear. Alfalfa Weevil Adult - Apply 1-2 pints per acre when insects appear. Lygus Bugs - Apply 2 pints per acre prior to bloom. Observe the indicated number of days after application before cutting or grazing. Do not apply more than once per season. Apply only to fields planted to pure stands of Alfalfa.

Pints of De Pesto Per Acre	Do Not Cut or Graze Within
½	7 days
1	14 days
2	28 days

RED CLOVER: asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asd

MINIMUM GALLONAGE REQUIREMENT: Ten gallons of finished spray per acre with ground equipment, two gallons per acre with aircraft.

FIELD CORN: Corn Rootworms - Use 1½ pints of De Pesto per 13,000 linear feet (1 acre with 40 inch spacing). Apply, at planting, as a 7 inch band over the row or inject on each side of the row by mixing with water or liquid fertilizers. When De Pesto is used with liquid fertilizers, mix in the following way making sure that the mixture is physically compatible. Premix 1 part of De Pesto with 2 parts of water. Add this premix to the tank of fertilizer along with rinsings from the premixing container. Maintain agitation in the tank after mixing and during application. Do not mix until ready to use.

SWEET CORN: asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf ;lkj asdf

SUGARCANE: Sugarcane Borer - Apply 1 - 1½ pints De Pesto per acre using ground or aerial equipment. Check sugarcane fields weekly, beginning in early June and continuing through August. Make first application only after visible joints form and 5% or more of the plants are infested with young larvae feeding in or under the leaf sheath and which have not bored into the stalks. Repeat whenever field checks indicate the infestation exceeds 5%. Do not apply within 17 days of harvest. Do not use in Hawaii.

CHAPTER 4

APPLICATION EQUIPMENT

PRE TEST

Answer the following questions true or false:

1. Stainless steel is the best nozzle material for extensive use.

   A. true
   B. false

2. Tungsten carbide and ceramic are inexpensive nozzle materials that may be subject to wear and corrosion.

   A. true
   B. false

3. Aluminum nozzles may corrode in the application of some fertilizers.

   A. true
   B. false

4. Low pressure field sprayers are often used to apply fertilizer-pesticide mixtures.

   A. true
   B. false

5. Ultra low volume sprayers apply a diluted pesticide solution.

   A. true
   B. false

6. Brass is an inexpensive nozzle material that wears easily.

   A. true
   B. false

7. Plastic nozzles wear out easily but are required for the spraying of certain solvents.

   A. true
   B. false

Answer the following multiple choice questions:

8. A spinning disc applicator is used to apply:

   A. dust.
   B. granules.
   C. wettable powders.
   D. All of these.

9. A solid stream nozzle would be used for:

   A. broadcast spraying.
   B. spraying foliage.
   C. injecting pesticide into the soil.
   D. wide band spraying.

10. Which of these determines which nozzle material will be used?

   A. price.
   B. corrosion.
   C. resistance to abrasion.
   D. All of these.

11. Which of these nozzle types would be used in overlapping groups for broadcast spraying?

   A. even flat fan.
   B. regular flat fan.
   C. full cone.
   D. solid stream.

12. Which of these would be preferred for over the top spraying of foliage?

   A. flooding nozzle.
   B. regular flat fan nozzle.
   C. hollow cone nozzle.
   D. broadcast nozzle.

13. Which of these could deliver a mist spray to the foliage on fruit trees?

   A. air blast sprayer.
   B. high pressure sprayer.
   C. hand sprayer.
   D. All of these

14. Which of these would be used to spray livestock?

   A. air blast sprayer.
   B. high pressure sprayer.
   C. low pressure field sprayer.
   D. None of these.

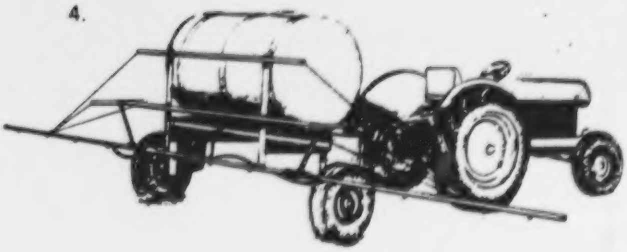
15. Which of these would be used to spray pastures?

   A. air blast sprayer.
   B. high pressure sprayer.
   C. low pressure field sprayer.
   D. hand sprayer.

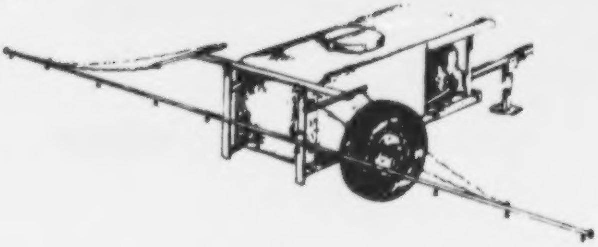
16. Match the following:

A. Hand sprayer ______
B. Low pressure field sprayer ______
C. Air blast sprayer ______
D. High pressure sprayer ______
E. Hand duster ______
F. Power duster ______
G. Granular applicator ______

4.

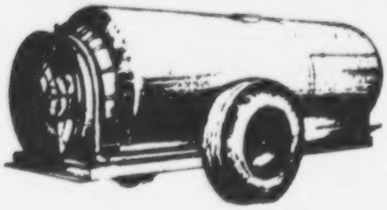


1.



5.

2.



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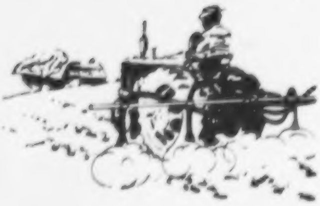

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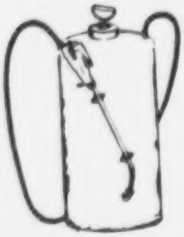

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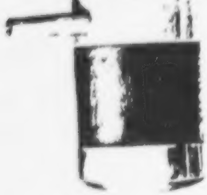
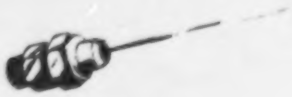


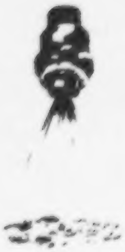
17. Match the following:

A. #____

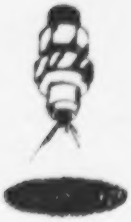


1. Even flat fan
2. Hollow cone
3. Broadcast
4. Solid stream
5. Regular flat fan
6. Full cone
7. Flooding nozzle

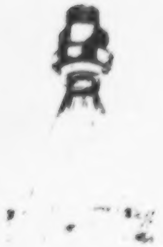
B. #____



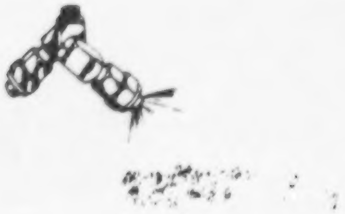
E. #____



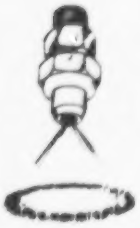
C. #____



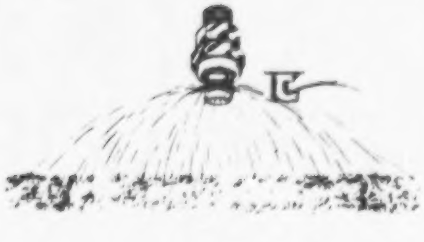
F. #____



D. #____



G. #____



CHAPTER 4

APPLICATION EQUIPMENT

LEARNING PROGRAM

1. The pesticide application equipment you use is important to the success of your pest control job. This chapter will cover the types of equipment you may want to use.

GO ON TO THE NEXT FRAME

SPRAYERS

2. Sprayers are used to apply liquid formulations and those formulations that are to be mixed with water.

Which of these would be applied with a sprayer?

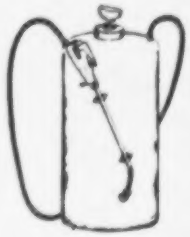
A. Solutions.
B. Wettable powders.
C. Both of these.

---

3. The simplest type of sprayer is the *hand sprayer.*

This sprayer is good for:

A. Large jobs.
B. Small jobs.



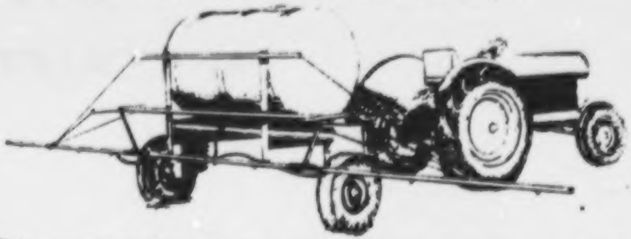
---

4. The hand sprayer is preferred over larger sprayers for treating:

A. Large areas.
B. Restricted areas.

B
Restricted areas.

5. Another type of sprayer is the *low pressure field sprayer.*



This sprayer consists of a large tank, a pump, pressure regulator, strainer, etc. connected to a boom of nozzles. The pressure to force the liquid out of the nozzles comes from:

A. The weight of liquid in the tank.
B. A motor driven pump.

B
A motor driven pump.

6. The rate of flow from a low pressure field sprayer is (high/low).

---

low.

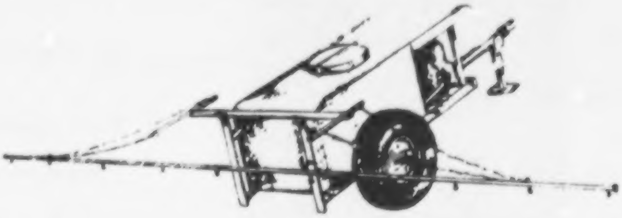
7. Most low pressure field sprayers are used to treat field and forage crops, pastures and fence rows. They may also be used to apply fertilizer-pesticide mixtures.

Low pressure field sprayers would be good for treatment of an:

A. Alfalfa field.
B. Apple orchard.

A
Alfalfa field.

8. *High pressure sprayers* deliver high volume at high pressure.



Because of the force behind the pesticide, the high pressure sprayer can produce a (high/low) volume of pesticide.

---

high.

9. High pressure sprayers can give:

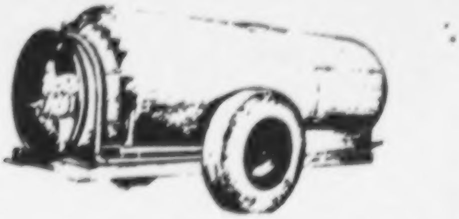
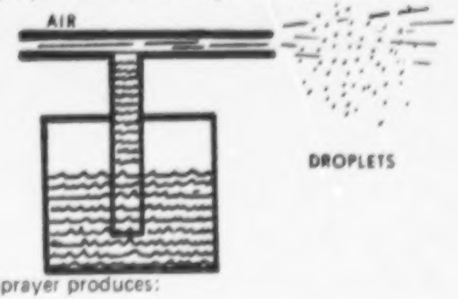
A. Good pesticide penetration.
B. Poor pesticide penetration.

Good pesticide penetration.

10. Because they can deliver high volumes of pesticides at high pressure into hard-to-get-at places, high pressure sprayers are used to spray fruits, vegetables, landscape plants and livestock.

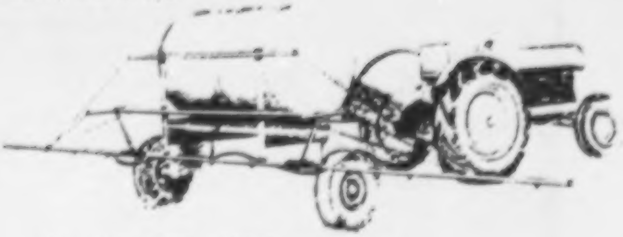
High pressure sprayers would be preferred over low pressure field sprayers in the treatment of:

A. Tomato plants.
B. Pastures.

A Tomato plants.	11. *Air blast sprayers* use a high speed air stream to break up the pesticide into droplets.  The air blast sprayer uses the force of a (fan/pump) to deliver the pesticide to its target.
fan.	12. The air blast sprayer works something like an atomizer.  The air blast sprayer produces: A. A heavy spray. B. A mist spray.
B A mist spray.	13. Air blast sprayers are used to spray fruit and vegetable crops. The air blast sprayer would be preferred in the treatment of: A. The fruit and foliage of orange trees. B. Low growing hedges and landscape plants.
A The fruit and foliage of orange trees.	14. Because of the mist spray produced, the air blast sprayer is (more/less) subject to drifting than are some other sprayers.
more.	15. Ultra low volume solutions are highly concentrated formulations. In fact they may even be pure pesticide. The machine used to apply these solutions must be able to apply (light/heavy) applications.

16. Identify this sprayer:

light

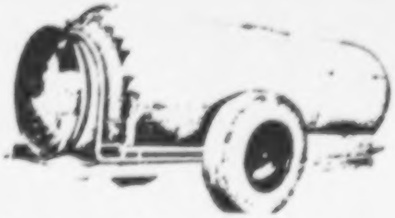


A. Low pressure field sprayer.
B. High pressure sprayer.
C. Air blast sprayer.

---

17. Identify this sprayer:

A
Low pressure field sprayer

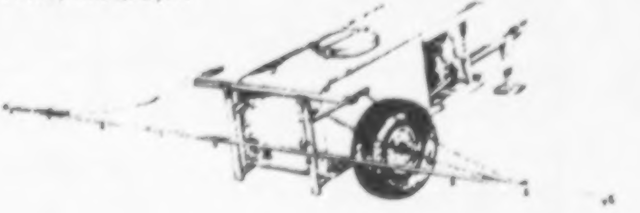


A. Low pressure field sprayer.
B. High pressure sprayer.
C. Air blast sprayer.

---

18. Identify this sprayer:

C
Air blast sprayer.



High pressure sprayer

19. Match these:

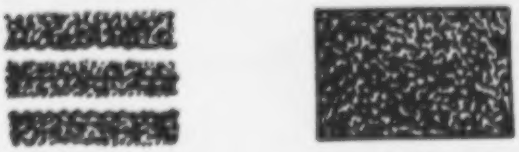
A. Hand sprayer ______
B. Low pressure field sprayer ______
C. High pressure sprayer ______
D. Ultra low volume sprayer ______
E. Air blast sprayer ______

1. Delivers high volume for fruits, vegetables, landscape plants and livestock.
2. Produces mist spray.
3. Good for restricted areas.
4. Are used to apply pesticides to many field crops.
5. Applies highly concentrated pesticides at low volumes.

NOZZLES

A. 3
B. 4
C. 1
D. 5
E. 2

20. The nozzle directs the spray of pesticide and determines how much area will be covered by the spray.


Band Coverage
Broadcast Coverage

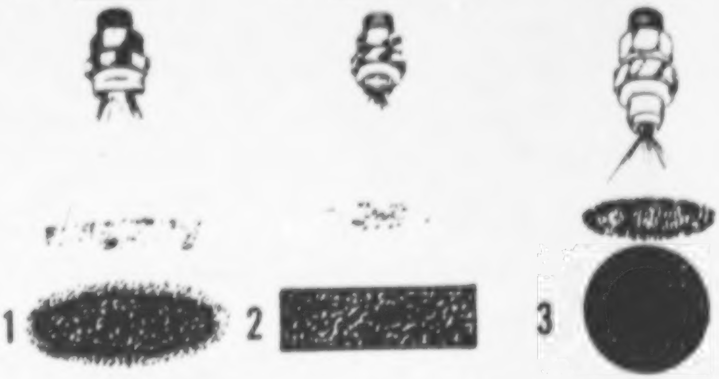
Narrow band application and broadcast spraying may require (the same/different) nozzle types.

---

different.

21. Match the nozzle spray pattern to the nozzle that produced it.

A. #____ B. #____ C. #____



A. 2
B. 1
C. 3

22. The *solid stream nozzle* produces a narrow jet.

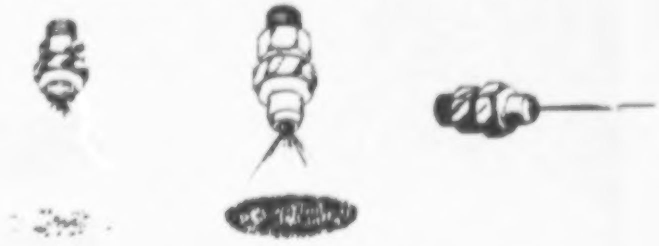
The *flat fan nozzle* produces a flat oval pattern.

The *cone nozzle* produces a circular pattern.

GO ON TO THE NEXT FRAME.

---

23. Label the nozzles below as solid stream, flat fan or cone.



________ ________ ________

Flat fan.
Cone.
Solid stream.

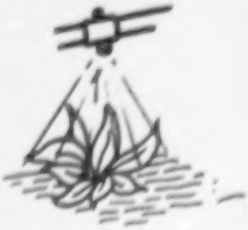
24. Which nozzle type would be *more accurate* for aiming at distant targets?

A. Solid stream.
B. Flat fan.
C. Cone.

Solid stream.

25. Which would produce more complete coverage of plant foliage in an over-the-top application?

A. Solid stream.
B. Flat fan.
C. Cone.



C
Cone.

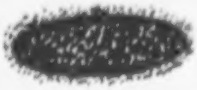
26. Which would be better for applying very narrow bands or injecting pesticide into the soil?

A. Solid stream.
B. Flat fan.
C. Cone.

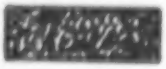
A
Solid stream.

27. There are several types of flat fan nozzles. The *regular* flat fan nozzle makes a flat oval pattern with light edges.

Which picture shows this regular flat fan pattern?



A.

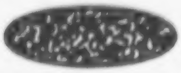


B.

---

28. The *even* flat fan nozzle makes a uniform pattern.

Label these patterns as regular or even flat fan.



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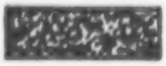

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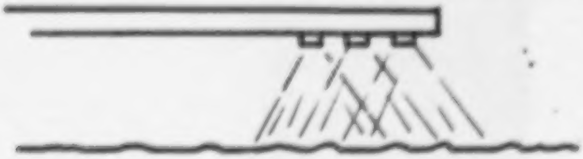
29. The regular flat fan nozzle is used on booms with the spray overlapping.

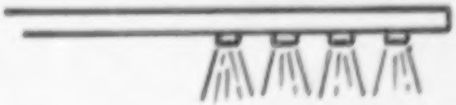


The regular flat fan nozzle is used for:

- A. Band spraying (narrow strips).
- B. Broadcast spraying.

---

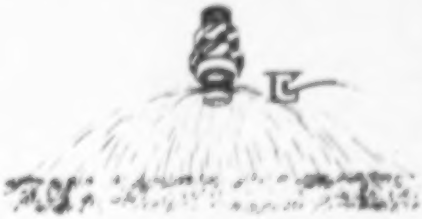
30. The even flat fan nozzle is used without overlapping.



The even flat fan nozzle is used for (band/broadcast) spraying.

---

31. Another type of flat fan nozzle is the *flooding nozzle*. This makes a wide angle pattern.

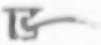


The flooding nozzle is designed for:

- A. Band spraying.
- B. Broadcast spraying.

---

32. Notice the path the liquid takes as it leaves the flooding nozzle.



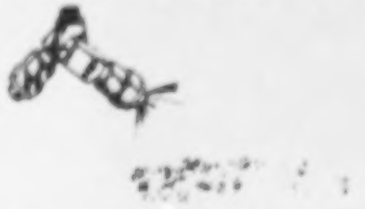
The flooding nozzle appears to be a (high/low) pressure nozzle.

---

33. Therefore, a flooding nozzle would more likely appear on a:

- A. Low pressure field sprayer.
- B. High pressure sprayer.

34. A broadcast nozzle is another wide angle flat fan nozzle. It is used on boomless sprayers and on the end of booms to widen the path of coverage.

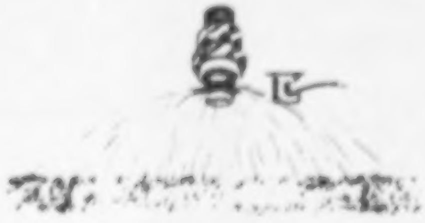


The broadcast nozzle operates at a (higher/lower) pressure than the flooding nozzle.

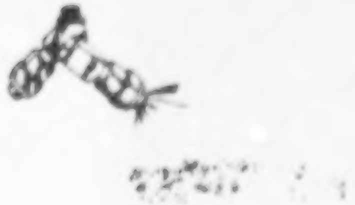
---

35. Which of these is the broadcast nozzle?

A.



B.



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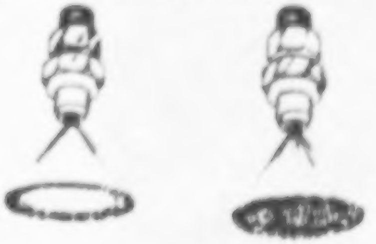
36. There are two (2) types of cone spray nozzles.

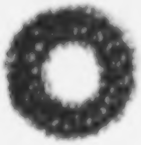


They are the ________________ cone and the ________________ cone nozzle.

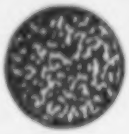
37. The hollow cone pattern is produced by one of two methods: (1) core and disc, or (2) whirl chamber.

The whirl chamber will produce which pattern below?

A.

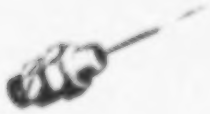


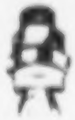
B.



---

38. Identify these nozzles:





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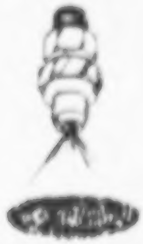
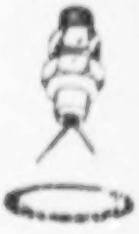
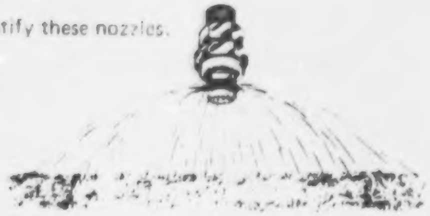
39. Identify these nozzles:



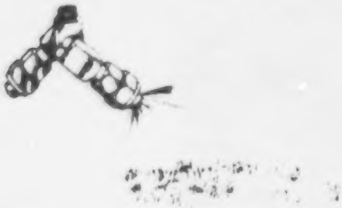


Full cone.
Hollow cone.

40. Identify these nozzles.



____
____



____
____

Flooding nozzle.
Broadcast nozzle.

41. Match these:

A. Solid stream ______
B. Regular flat fan ______
C. Even flat fan ______

1. Used to apply narrow band or to inject pesticide into soil.
2. Flat oval pattern with lighter edges, used on booms for broadcast spraying.
3. Uniform flat oval pattern used for band spraying.

A. 1
B. 2
C. 3

42. Match these:

A. Flooding nozzle ______
B. Broadcast nozzle ______
C. Hollow cone nozzle ______
D. Full cone nozzle ______

1. Works by either core and disc or whirl chamber.
2. Spray uniform throughout circular pattern.
3. Used on boomless sprayers or ends of boom to widen spray swath.
4. Low pressure nozzle used for broadcast spraying.

A. 4
B. 3
C. 1
D. 2

NOZZLE MATERIALS

43. Along with the correct choice of nozzle types, it is equally important to select nozzles made from materials that will not be damaged by the pesticide.

For example, wettable powder and flowable formulations can be abrasive. A nozzle used to apply wettable powders should be made from a (hard/soft) material.

---

hard.

44. One quality of nozzle material is resistance to ____________________.

Abrasion, or wear

45. Rust is an example of corrosion. Ordinary steel corrodes when exposed to air and water.

Would ordinary steel be a good material for nozzles? (yes/no)

[illegible]

46. Nozzle material should be resistant to:

A. Abrasion.
B. Corrosion.
C. Both of these.

[illegible]

47. Cost is another factor to consider when choosing nozzles. Materials that are resistant to both corrosion and abrasion may be expensive.

Inexpensive materials may be used if corrosion and abrasion (are/are not) a problem.

---

are not

48. Look at Exhibit I. This Exhibit shows the common materials used in making nozzles.

Check the features of brass nozzles. Should brass nozzles be used if the spraying liquid is abrasive? (yes/no)

[illegible]

49. Tungsten carbide or ceramic nozzles are hard and resist abrasion. Check information in Exhibit I.

If abrasion is a problem, (brass/tungsten carbide) would be a better material.

Tungsten carbide.

50. But if non-abrasive liquids are used under limited conditions, the cheaper (brass/tungsten carbide) nozzles would be preferred.

Brass.

51. Plastics can be made resistant to corrosion.

However, according to Exhibit I, the problem with plastics is that:

A. They corrode.
B. They wear easily.
C. They swell in contact with some solvents.

C
They swell in contact with some solvents.

52. Aluminum nozzles:

A. Resist corrosion.
B. Resists most corrosive materials except some fertilizers.

B
Resists most corrosive materials except some fertilizers.

53. Stainless steel:

A. Will not corrode.
B. Resists abrasion.
C. Both of these.

C
Both of these.

54. According to Exhibit I which is the best nozzle material for extensive use?

______ ______ ______________________

Stainless steel

55. Match these:

A. Brass ______
B. Stainless steel ______
C. Plastic ______
D. Aluminum ______
E. Tungsten carbide and ceramic ______

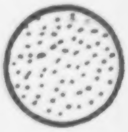
1. Swells when exposed to some solvents.
2. Best material for extensive use.
3. Best material for limited use.
4. Corroded by some fertilizers.
5. Expensive.

A. 3
B. 2
C. 1
D. 4
E. 5

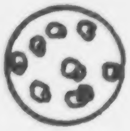
DUST AND GRANULAR APPLICATORS

56. Pesticide dusts and granules are made to be applied dry and because of this, dusts and granules require different kinds of application equipment.

Dust



Granules



Which of the above can be blown to its target with a blast of air? (dust/granules)

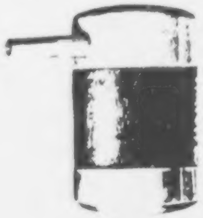
Dust.

57. Because of their size and weight, granule particles will have to be:

A. Carried to their target by air currents.
B. Thrown or dropped on their target.

B
Thrown or dropped on their target.

58. The applicator pictured below works by squeezing. A puff of air carries the pesticide to its target.



This is a hand (duster/granular) applicator.

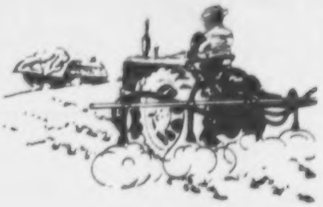
---

duster.

59. Like hand sprayers, hand dusters are used mainly around homes and in gardens.

Hand dusters are good for (large/small) jobs.

60. *Power dusters* use a power driven fan or blower to get the dust to the target.



One problem with a power duster would be:

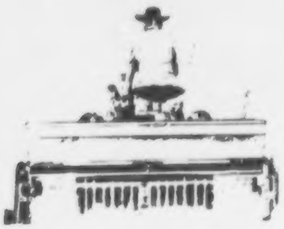
A. Incomplete coverage.
B. Drifting of dust.

B

Drifting of dust.

61. Granular applicators come in several types.

One type uses hand carried spinning discs. Another type is tractor mounted or tractor driven.



The above machine applies ____________.

Granules.

62. Which of these is a granular applicator?

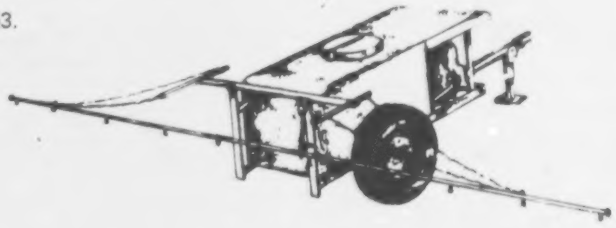
A. Hand carried spinning disc type.
B. Hand operated bellows.

A

Hand carried spinning disc

REVIEW AND SUMMARY

63.



The above sprayer is a:

A. Low pressure field sprayer.
B. High pressure sprayer.
C. Air blast sprayer.

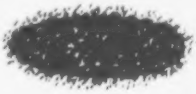
64. Which of these sprayers uses the least amount of water?

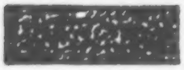
- A. Low pressure field sprayer.
- B. High pressure sprayer.
- C. Air blast sprayer.
- D. Ultra low volume sprayer.

65. A whirl chamber nozzle will produce a:

- A. Full cone pattern.
- B. Hollow cone pattern.
- C. Broadcast pattern.
- D. All of the above.

66. Which of these is the regular flat fan pattern?

A. 

B. 

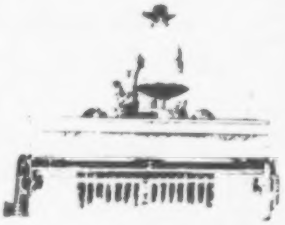
A

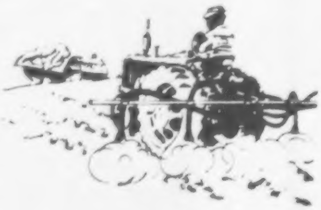
67. Which of these nozzle materials is probably best for all around use?

- A. Brass.
- B. Tungsten carbide.
- C. Stainless steel.

C
Stainless steel.

68. Which of these is a power duster and which is a granular applicator?





______________________ ______________________

______________________ ______________________

Granular applicator.
Powder duster.

You have now completed Chapter 4.

CHAPTER 4

APPLICATION EQUIPMENT

POST TEST

Answer the following questions true or false:

1. Stainless steel is the best nozzle material for extensive use.

   A. true
   B. false

2. Tungsten carbide and ceramic are inexpensive nozzle materials that may be subject to wear and corrosion.

   A. true
   B. false

3. Aluminum nozzles may corrode in the application of some fertilizers.

   A. true
   B. false

4. Low pressure field sprayers are often used to apply fertilizer-pesticide mixtures.

   A. true
   B. false

5. Ultra low volume sprayers apply a diluted pesticide solution.

   A. true
   B. false

6. Brass is an inexpensive nozzle material that wears easily.

   A. true
   B. false

7. Plastic nozzles wear out easily but are required for the spraying of certain solvents.

   A. true
   B. false

Answer the following multiple choice questions:

8. A spinning disc applicator is used to apply:

   A. dust.
   B. granules.
   C. wettable powders.
   D. All of these.

9. A solid stream nozzle would be used for:

   A. broadcast spraying.
   B. spraying foliage.
   C. injecting pesticide into the soil.
   D. wide band spraying.

10. Which of these determines which nozzle material will be used?

   A. price.
   B. corrosion.
   C. resistance to abrasion.
   D. All of these.

11. Which of these nozzle types would be used in overlapping groups for broadcast spraying?

   A. even flat fan.
   B. regular flat fan.
   C. full cone.
   D. solid stream.

12. Which of these would be preferred for over the top spraying of foliage?

   A. flooding nozzle.
   B. regular flat fan nozzle.
   C. hollow cone nozzle.
   D. broadcast nozzle.

13. Which of these could deliver a mist spray to the foliage on fruit trees?

   A. air blast sprayer.
   B. high pressure sprayer.
   C. hand sprayer.
   D. All of these.

14. Which of these would be used to spray livestock?

   A. air blast sprayer.
   B. high pressure sprayer.
   C. low pressure field sprayer.
   D. None of these.

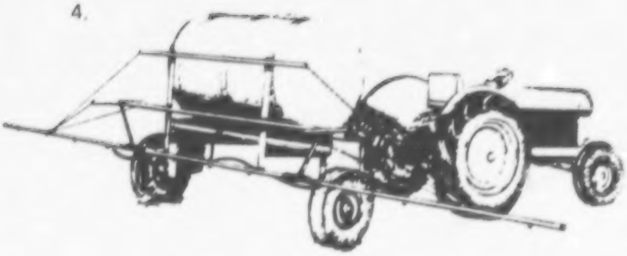
15. Which of these would be used to spray pastures?

   A. air blast sprayer.
   B. high pressure sprayer.
   C. low pressure field sprayer.
   D. hand sprayer.

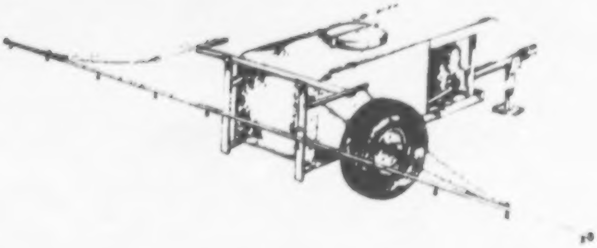
16. Match the following:

A. Hand sprayer ______
B. Low pressure field sprayer ______
C. Air blast sprayer ______
D. High pressure sprayer ______
E. Hand duster ______
F. Power duster ______
G. Granular applicator ______

4.

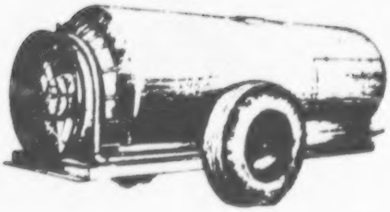


1.

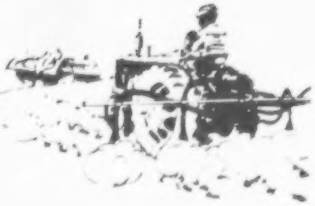


5.

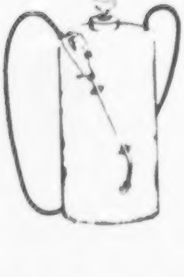
2.



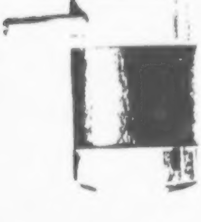
6.



3.



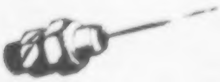
7.



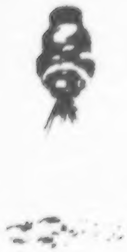
17. Match the following

1. Even flat fan
2. Hollow cone
3. Broadcast
4. Solid stream
5. Regular flat fan
6. Full cone
7. Flooding nozzle

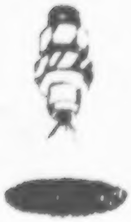
A. #_____



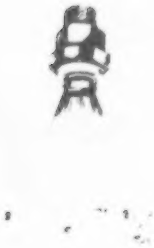
B. #_____



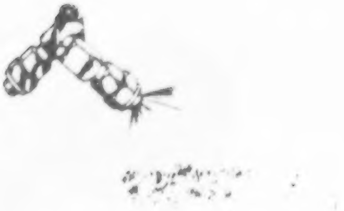
E. #_____



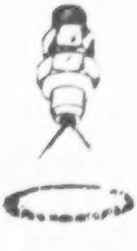
C. #_____



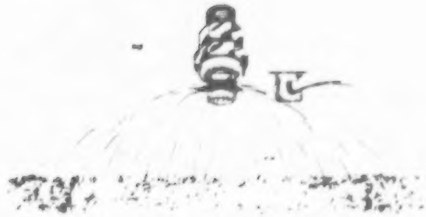
F. #_____



D. #_____



G. #_____



YOU CAN GET NOZZLES IN MANY MATERIALS. HERE ARE THE MAIN FEATURES OF EACH KIND.

BRASS:

- INEXPENSIVE,
- WEARS QUICKLY FROM ABRASION,
- PROBABLY THE BEST MATERIAL FOR LIMITED USE.

STAINLESS STEEL:

- WILL NOT CORRODE,
- RESISTS ABRASION, ESPECIALLY IF IT IS HARDENED,
- PROBABLY THE BEST MATERIAL FOR EXTENSIVE USE.

PLASTIC:

- RESISTS CORROSION AND ABRASION,
- SWELLS WHEN EXPOSED TO SOME SOLVENTS.

ALUMINUM:

- RESISTS SOME CORROSIVE MATERIALS,
- IS EASILY CORRODED BY SOME FERTILIZERS.

TUNGSTEN CARBIDE AND CERAMIC:

- HIGHLY RESISTANT TO ABRASION AND CORROSION,
- EXPENSIVE.

CHAPTER 5

USE AND MAINTENANCE OF PESTICIDE APPLICATION EQUIPMENT

PRE TEST

Answer the following true or false:

1. A change in sprayer pressure will change the flow rate but will not affect the nozzle patterns or spray droplet size.

   A. true
   B. false

2. In order to properly make emergency repairs in the field, the operator of the sprayer should dismount and remove his gloves and protective mask before working on the sprayer.

   A. true
   B. false

3. Sprayers should be calibrated by spraying pesticide formulation.

   A. true
   B. false

4. If you are calibrating a sprayer that has a 200 gallon capacity, you should spray an area large enough to use at least 20 gallons.

   A. true
   B. false

5. The best source of equipment operating information is from the operator's manual.

   A. true
   B. false

6. Nozzles that have a faulty spray pattern should be replaced.

   A. true
   B. false

Answer the following multiple choice questions:

7. Which of these can be used to clean nozzles?

   A. clean knife.
   B. screw driver.
   C. heavy gauge steel wire.
   D. wooden toothpick or toothbrush.

8. If the sprayer nozzles clog during spraying, the operator should:

   A. increase pressure to break the clog.
   B. stop the sprayer immediately, and unclog the nozzles before doing anything else.
   C. turn the sprayer off and move it to the edge of the field before attempting to work on it.
   D. continue spraying if enough nozzles are working. Fix the sprayer when all of the spray has been applied.

9. A sprayer is calibrated to apply 10 gallons per acre at a pressure of 20 psi. What pressure would be required to increase the output to 20 gallons per acre without changing the speed of travel or nozzle size?

A. 40 psi
B. 60 psi
C. 80 psi
D. None of these. A change in pressure could not be used to produce that large a change in sprayer output.

10. What is the best method to insure proper mixing of a wettable powder formulation?

A. Add the pesticide, then stir the mixture as the tank fills.
B. Make a slurry, and pour it into a partly filled tank before filling the tank. Agitate as the tank is filled.
C. Fill the tank to 1/3 full of water, add the wettable powder, agitate and fill to capacity.
D. Mix in a barrel until the powder and water are thoroughly mixed, then add to a full tank of water under agitation.

11. A sprayer is calibrated to apply 20 gallons per acre (gpa) at a speed of 4 miles per hour.

What would be the application rate if the sprayer were slowed to 2 miles per hour?

A. 5 gpa
B. 10 gpa
C. 40 gpa
D. There would be no change in application rate.

12. At which of the following amounts per acre should you stop and recalibrate your granular applicator if you need a recommended dosage of 7 pounds per acre?

A. 6.3 lb. per acre.
B. 6.8 lb. per acre.
C. Both of these would require recalibration.
D. Neither of these. They are both within the 5% limit so that recalibration is unnecessary.

13. In calibrating your sprayer with a 100 gallon capacity, you poured 6¼ gallons of water back into the tank to fill it after spraying ¼ of an acre.

What is the spray rate in gallons per acre of your sprayer?

A. 18¾ gpa
B. 15¼ gpa
C. 6¼ gpa
D. 25 gpa

14. Your sprayer has 6 nozzles. In a one minute flow check you find the flow rates as shown below. Which of these nozzles will have to be replaced? (Choose all that apply.)

NOZZLE	FLOW RATE (in fluid oz./min.)
A	8.0
B	7.5
C	8.2
D	7.8
E	8.3
F	8.2

Problems – Fill in the blanks:

15. Your spray tank holds 200 gallons of spray. During calibration, you had to replace 8 gallons of water after spraying one acre.

This sprayer applies at a rate of ____________ gpa.

A tank full of spray will cover ____________ acres.

Label directions on a can of emulsifiable concentrate tell you to apply 2 pints of the formulation per acre. How many pints should you add to one tank load?

____________ pints

16. A sprayer with a 200 gallon tank is calibrated to apply 40 gallons per acre.

To apply 2 pounds of active ingredient per acre of a 50% wettable powder, you will need to add how many pounds of pesticide formulation into the tank?

A full tank will cover ____________ acres.

This will require ____________ pounds of active ingredient per tank.

You must add ____________ pounds of 50% wettable powder formulation per tankful.

CHAPTER 5

USE AND MAINTENANCE OF PESTICIDE APPLICATION EQUIPMENT

LEARNING PROGRAM

1. Proper use and maintenance of pesticide application equipment is essential for safe, effective pest control.

This chapter will cover some basic points about the operation, maintenance and calibration of this equipment.

GO ON TO THE NEXT FRAME

SPRAYERS

2. The pesticide label specifies how much pesticide must be applied per acre. This is usually given in terms of the undiluted pesticide.

For example, a pesticide label states that 2 pints of the formulation must be applied per acre to kill a certain type of insect. This is 2 pints of:

A. the pesticide as it comes from the container.
B. pesticide and water mixture.

A
the pesticide as it comes from the container.

3. Pesticide formulations may have to be mixed with water before they can be applied.

Suppose the pesticide label instructs you to apply 1 pint of formulation per acre. Your sprayer applies liquid at a rate of 10 gallons per acre.

The 1 pint of pesticide should be diluted with ______________ gallons of water to treat one acre.

10

4. Suppose your sprayer tank holds 50 gallons? If you are to apply 1 pint of formulation per acre, how much formulation should you add to a full tank of water? (The sprayer applies at a rate of 10 gallons per acre.)

To find this, divide the amount of water in the tank by the number of gallons applied to one acre.

50 gallons will spray ______________ acres.

At 1 pint per acre, this will require ______________ pints of pesticide formulation.

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5 (50/10 = 5)
5

5. How many pints of formulation are required in this situation?

Tank capacity = 75 gallons

Sprayer applies 10 gallons per acre.

Instructions call for 2 pints of formulation per acre.

75 gallons will spray ________________ acres.

You must add ________________ pints of formulation to a tankful of water.

7.5 (75/10 = 7.5)
15 (2 x 7.5 = 15)

6. Is it important to know how much liquid your sprayer applies per acre? (yes/no)

---

yes

CALIBRATION OF SPRAYERS

7. Calibration is simply measuring your spray equipment output so that you can apply a desired rate of pesticide. There are many ways to calibrate a sprayer. Your extension agent can show you appropriate methods for your particular equipment.

The following is a basic method.

GO ON TO THE NEXT FRAME

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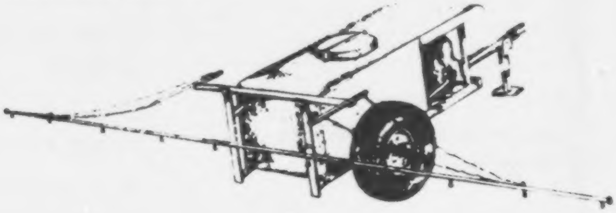
8. To calibrate a sprayer, first choose the speed, pumping pressure and nozzles you want to use.



For reasons of safety, we will have a trial run on a measured area (such as one acre). The sprayer tank will be filled with:

A. plain water. B. pesticide.

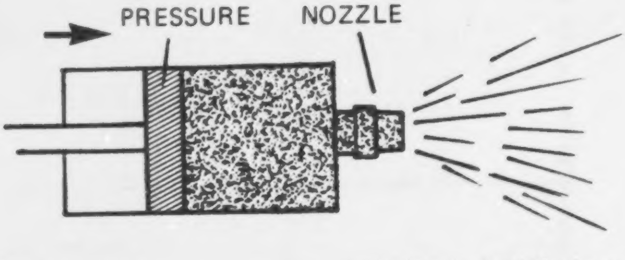
A
plain water.

9. The spray tank is filled with water, and the sprayer is operated in place to fill the system. The tank is then topped off.

Next, the measured area is sprayed as though you were applying pesticide.

After spraying, the amount of water it takes to refill the tank is measured.

If you sprayed one acre, and it takes 6 gallons to refill the spray tank, the sprayer is applying at a rate of ________________ per acre.

6 gallons	10. If your tank has a 100 gallon capacity or larger, you should spray an area large enough to use at least 10% of the tank capacity. For a 100 gallon sprayer, you should spray at least ____ gallons of water to test the sprayer.
10 (100 x 10% = 10)	11. Suppose you spray an area of ¼ acre and use 5 gallons of water. Your sprayer is applying liquid at a rate of ____ gallons per acre (gpa).
20	12. If the rate of spray is not correct for the purposes you have in mind, you will have to ____ the rate the sprayer is applying liquid.
change	13. There are several factors that you can change to adjust the rate of pesticide applied per acre. Flow rate from the nozzles is one factor. The faster liquid flows from the nozzles, the ____ pesticide applied.
more	14. The flow rate depends on 2 things:  The amount of ____ applied to the liquid in the sprayer. And the size of the ____ opening.
pressure nozzle	15. An increase in pressure will ____ flow rate. A reduction in pressure will ____ flow rate.

increase
reduce

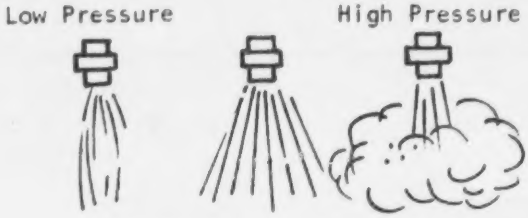
16. However, pressure must be increased four (4) times in order to double the flow rate.

If a sprayer applies 1 pint of liquid per minute at 25 pounds per square inch (psi), how much pressure is needed to increase the flow rate to 2 pints per minute?

A. 50 psi
B. 100 psi

B
100 psi
(This is 4 times 25 psi.)

17. Changes in pressure may change the nozzle pattern and droplet size.

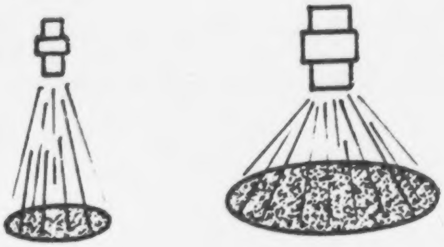


A change in nozzle pattern and droplet size (is/is not) always desirable.

---

is not

18. Another way to change the flow rate is to use nozzles with larger or smaller openings.

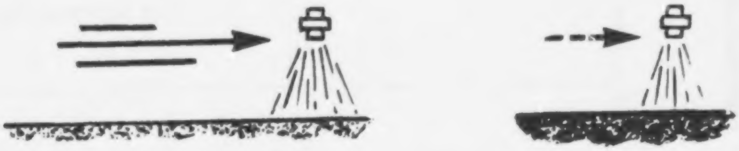


If it is not desirable to change nozzle patterns or droplet size, then flow rate can be changed by using nozzles with larger or smaller ________________.

---

openings

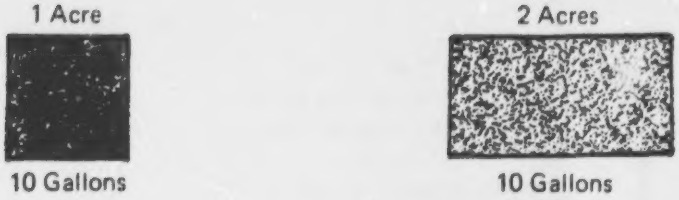
19. Another way to change the rate of application per acre is to change the ground speed of the sprayer.



The slower the sprayer moves, the ________________ spray is applied to the area.

more

20.



In the situations above, both sprayers have sprayed 10 gallons. In the first picture the sprayer applies ________________ gallons per acre.

In the second case, the faster moving sprayer applies only ________________ gallons per acre.

10
5

21. If the sprayer slows down and applies 10 gallons to ½ acre, the sprayer is applying liquid at a rate of ________________ gallons per acre.

20

22. Increasing the ground speed of the sprayer means (more/less) spray per acre.

Slowing down the ground speed of the sprayer will (increase/decrease) the rate of application.

---

less
increase

23. Increasing the speed of the tractor pulling the sprayer from 2 miles per hour to 4 miles per hour will (if pressure and nozzle size stay the same):

A. cut the application rate in half.
B. double the application rate.

If the application rate above was 10 gallons per acre at 2 miles per hour, what will the new application rate be?

____

A

cut the application rate in half.

5 gallons per acre.

24. When pressure, speed or nozzle size have been changed, you should:

A. try to figure out how much sprayer output has changed.
B. recalibrate the sprayer by a trial run on a measured piece of land.

B **[illegible]librate the sprayer by a [illegible] run on a measured piece [illegible]** **[illegible] should be left to [illegible]work.)**	25. Suppose you are recalibrating your sprayer and find that after spraying 1 acre with water, the tank needs 8 gallons to top it off. The sprayer tank holds 50 gallons, and the pesticide label instructs you to apply 2 pints per acre. Sprayer rate is ____________ gpa. The 50 gallon tank will spray ____________ acres. The number of pints per tankful is ____________.
[illegible] **6.25 (50/8 = 6.25)** **12.5 (6.25 x 2)**	26. To apply pesticide evenly and accurately, the sprayer must: A. move at a constant speed. B. operate at a constant pressure. C. Both of these.
C **Both of these.**	APPLYING WETTABLE POWDER 27. Wettable powders are designed to be applied with a sprayer. A 50% wettable powder formulation is: A. all active ingredient. B. half active ingredient.
B **half active ingredient.**	28. There is ____________ pounds of active ingredient in 1 pound of 50% wettable powder formulation.
½	29. There is ____________ pounds of active ingredient in 1 pound of 25% wettable powder formulation.
¼	30. If the label instructs you to apply 1 pound of active ingredient per acre, how much 50% wettable powder formulation must be applied per acre?
2 pounds	31. Your 50 gallon sprayer is calibrated to apply 10 gallons per acre. The label directions on the pesticide container instruct you to apply the 50% wettable powder formulation at a rate of 1 pound of *active ingredient* per acre. How much wettable powder formulation should be added per tankful of water? ________________________

[illegible] is [illegible] acre).

B

an uneven mixture that may be full of lumps.

A

MIXING WETTABLE POWDER

32. Wettable powder presents some problems in mixing.

Wettable powders do not dissolve in water. Instead, they form a mixture like flour and water.

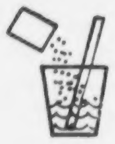
If you simply dump the bag of wettable powder into the sprayer tank you will get:

- A. an even mixture.
- B. an uneven mixture that may be full of lumps.

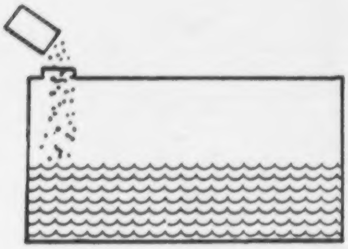
---

33. First, the wettable powder must be added to a clean bucket that is partially full of water. The resulting mixture, called a *slurry*, is then mixed well.

Which of these shows how a slurry is made?



A

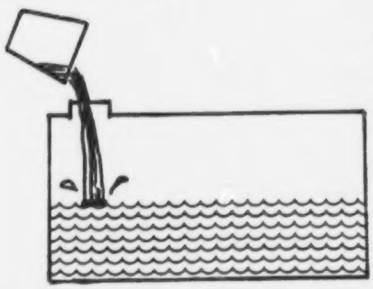


B

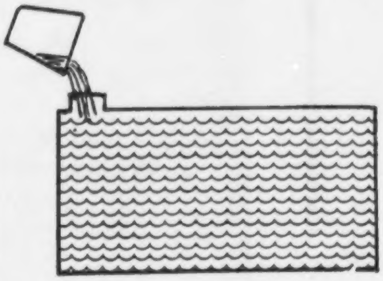
---

34. The slurry is then added to a partially filled tank. This makes uniform mixing possible.

The slurry should be added as shown in which picture?

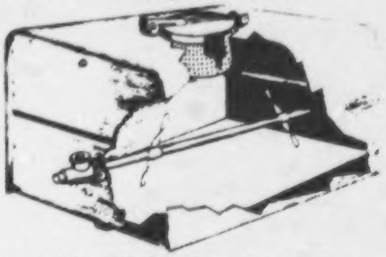


A



B

35. After the tank is filled with water, the contents must be agitated to keep the wettable powder from settling to the bottom.



While filling the partially filled tank with water, you must have the agitator (off/working).

working

36. To mix wettable powder, first put the powder into a clean bucket partially filled with ____________.

By stirring the mixture you make a ____________.

water
slurry

37. Next, the slurry is added to a (completely/partially) filled spray tank.

partially

38. As water is added to fill the tank, the agitator should be ____________ the liquid in the spray tank.

stirring

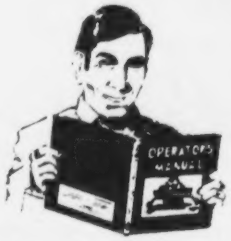
MAINTENANCE OF SPRAYERS

39. When operating a sprayer, it is better to:

A. wait for trouble to occur.
B. try to prevent trouble.

B.
try to prevent trouble.

40. One way to prevent trouble is to correctly follow instructions for sprayer operation.



These instructions can be found in the operator's ____________.

[redacted]

41. In order to prevent clogging or accidental mixing of different pesticides, old formulations (should/should not) be left in the sprayer.

The sprayer should be drained and rinsed:

A. after each use.
B. about once a month.

42. Sometimes equipment clogs or other trouble occurs while the equipment is being used.

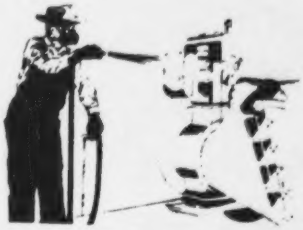
If this happens:

A. try to finish spraying and then correct the problem.
B. turn off the sprayer at once.

43. There will be less danger of an overdose in the field if:

A. the sprayer is left in the middle of the field while repairs are being made.
B. the sprayer is moved to the edge of the field before making repairs.

44. Some pesticides require special protective clothing during handling and application.



Should a protective mask or gloves be removed when making an emergency repair of a sprayer? (yes/no)

45. If nozzles clog or other trouble occurs in the field during spraying:

_______________ _______________ the sprayer.

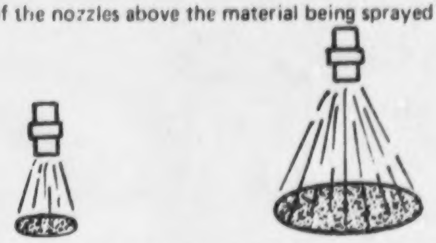
Move it to the _______________ of the field before dismounting to correct the problem.

The operator (can/should not) remove protective clothing while making repairs.

USE AND CARE OF NOZZLES

46. One source of potential trouble on a sprayer is the nozzles.

The height of the nozzles above the material being sprayed is important.



This nozzle height (affects/does not affect) the spray pattern.

---

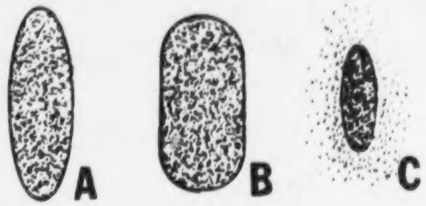
47. Before spraying, the nozzles must be adjusted to the proper ________________ for the job.

---

48. All nozzles on the sprayer should be of the proper type and size for the job. Each nozzle in the system must deliver its rated amount of pesticide.

Nozzles that are not flowing at the proper rate or have faulty spray patterns should be replaced.

The spray patterns below are from flat fan nozzles. Which nozzle should be replaced?



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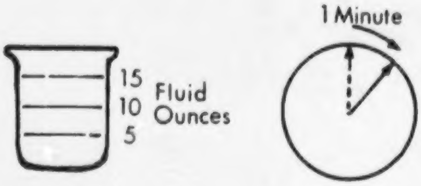
49. The flow rates of each nozzle should be checked.

Flow rate is the amount of liquid coming from the nozzle in a given period of time.

Flow rate can be measured in:

A. fluid ounces.
B. minutes.
C. fluid ounces per minute.

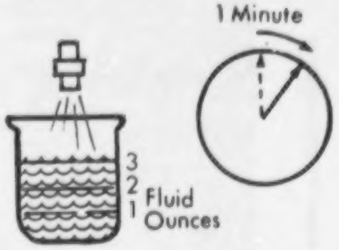


Eight ounces per minute.

50. The flow rate of each nozzle can be checked by filling the sprayer with water and running each nozzle for a minute into a measuring jar.

What is the flow rate for the nozzle below?

____



3 fluid ounces per minute.

51. Any nozzle that has a flow rate of 5 percent more or less than the average of the nozzles in the system should be replaced.

Suppose the average of a boom of nozzles is 8 fl. oz. per min. 5% of 8 is 0.4. Which of the following nozzles should be replaced?

Nozzle	Flow Rate
A	8.3 fl. oz./min.
B	8.5 fl. oz./min.
C	7.8 fl. oz./min.
D	7.5 fl. oz./min.

B is more than 0.4 larger than 8.
D is more than 0.4 smaller than 8.

52. What is the average flow of these 5 nozzles?

Nozzle	Flow Rate
A	10.0 fl. oz./min.
B	10.5 fl. oz./min.
C	9.5 fl. oz./min.
D	10.1 fl. oz./min.
E	9.9 fl. oz./min.

10.0 fl. oz./min.

53. What is 5% of 10.0 fl. oz./min.?

0.5 fl. oz./min.

54. What flow rate is 5% above 10.0 fl. oz./min.?

What flow rate is 5% below 10.0 fl. oz./min.?

55. Which of these nozzles is 5% more or less than the average and should be replaced?

Nozzle	Flow Rate
A	10.0 fl. oz./min.
B	10.5 fl. oz./min.
C	9.5 fl. oz./min.
D	10.1 fl. oz./min.
E	9.9 fl. oz./min.

---

56. Which of these nozzles should be replaced?

Nozzle	Flow Rate
A	6.9 fl. oz./min.
B	7.0 fl. oz./min.
C	7.5 fl. oz./min.
D	6.5 fl. oz./min.
E	7.1 fl. oz./min.

[illegible] 7.0

[illegible] should be replaced.

57. Nozzles that are clogged should be cleaned. This must be done with something that will not damage the nozzle opening.

The tool used to clean a nozzle should be made from a material that is (harder/softer) than the nozzle material.

---

58. Which of these is softer than such nozzle materials as brass or stainless steel?

Choose all that apply.
- steel wire.
- wooden toothpick.
- toothbrush.
- pocket knife.
- metal file.

[illegible] toothpick.

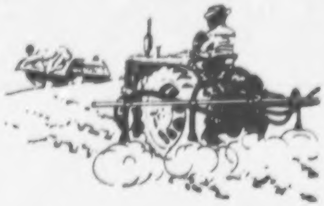
[illegible] toothbrush.

59. Nozzles should be cleaned only with a toothbrush or wooden toothpick.

A piece of wire fencing or a nail (will/will not) damage the nozzle.

DUSTERS AND GRANULAR APPLICATORS

60. Dusters and granular applicators apply dry formulations dropping the formulation on the target or blowing it on the target.



The speed at which the formulation is fed depends on how fast the applicator is moving. Changes in the land speed of a duster or granular applicator (will change/will not change) the rate of delivery.

---

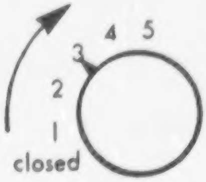
61. Bouncing a duster or granular applicator will:

A. cause variations in delivery.
B. not affect application.

---

62. The manufacturer's operating manual will tell you how to set gate openings for the product you are going to use.

Gate openings may vary if they are not set from the same direction, such as from closed to open.



GATE OPENING

GO ON TO THE NEXT FRAME

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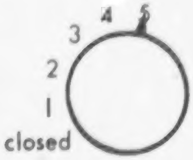
63. This setting was originally set by moving the dial from closed to the 3 position. Later it was set to 5. How should the control be reset to 3?



GATE OPENING

A. Move it back to 3 from the 5 position.
B. Move it to the closed position first, then to 3.

B

move it to the closed position first, then to 3.

64. Calibration of a duster or granular applicator is similar to the calibration of a sprayer. One difference is the duster or granular applicator must be filled with pesticide formulation.

Because it is applying actual pesticide, the calibration of a duster or granular applicator should be done on an area (larger/smaller) than that used for a sprayer.

---

smaller

65. To calibrate a duster or granular applicator, fill the hopper to a measured level. Operate the equipment over a measured area. This should be at least ¼ acre or 1000 feet of row.

Refill the hopper to the original level, carefully weighing the amount of pesticide needed. The amount needed to refill the hopper is the amount applied.

If the weight of pesticide applied is 1 pound, and the area treated is ¼ acre, the applicator is treating at a rate of ______________ pounds per acre.

4

66. If the amount applied does not fall within 5% of the recommended dosage, reset the gate opening and recalibrate.

Suppose the recommended dosage is 4 pounds per acre? Which of these would call for recalibration?

A. application of 4.1 lbs./acre.
B. application of 4.2 lbs./acre.
C. application of 3.9 lbs./acre.
D. All of these.

B

application of 4.2 lbs. per acre.

5% of 4 is 0.2.

67. While spraying, dusting and applying granular formulations, you should keep a record of the total amount of area treated and the total amount of pesticide used. If there is any significant variation from the recommended dosage, you (should/should not) make the necessary adjustments.

---

should

REVIEW AND SUMMARY

68. A sprayer is calibrated by spraying a measured area with:

A. plain water.
B. pesticide formulation.

A

plain water.

69. A sprayer with 100 gallons capacity requires 20 gallons of water to refill it after spraying 2 acres.

If the pesticide label says to apply 1½ pints of formulation per acre, how much pesticide should be added to a tank of water in the above sprayer?

Number of acres the sprayer can spray = ________________
Number of pints needed for this acreage = ________________

10 acres
[illegible] pints

70. Which of these will change application rate?

A. change in tractor speed.
B. change in sprayer pressure.
C. change in nozzle size.
D. All of these.

71. You can double sprayer output by:

A. doubling sprayer pressure.
B. increasing sprayer pressure 4 times.
C. cutting sprayer pressure in half.

B
increasing sprayer pressure 4 times.

72. Reducing sprayer speed from 4 mph to 2 mph will (half/double/not change) sprayer output per acre.

double

73. Your 60 gallon sprayer is calibrated to apply 5 gallons of liquid per acre. The label directions recommend that a 50% wettable powder formulation be applied at a rate of ½ pound of active ingredient per acre.

How much 50% wettable powder formulation should be added per tankful of water?

____

60/5 = 12 acres per tankful.

12 pounds of formulation will deliver ½ lb. of formulation per acre.

74. When mixing wettable powder:

A. you add the powder directly to a tankful of water.
B. you add the powder to ½ tankful of water.
C. you make it into a slurry first.

C
you make a slurry first.

75. Nozzles should be cleaned with:

A. a wire.
B. a clean knife.
C. a wooden toothpick or toothbrush.

C
a wooden toothpick or toothbrush.

76. Nozzles that have a faulty spray pattern should be ____________.

replaced

77. Instructions on how to operate a sprayer, duster, or granular applicator can be found in the ____________ ____________.

operator's manual.	78. If a sprayer clogs during operation, the operator should: A. stop immediately and fix the problem. B. stop the sprayer and move it to the edge of the field before doing anything.
B **stop the sprayer and move it to the edge of the field before doing anything.**	79. Protective equipment and clothing should be ______________ while making emergency repairs on the sprayer.
worn	80. Which of these spray nozzles should be replaced? Nozzle — Flow Rate A — 12.2 fl. oz./min. B — 12.0 fl. oz./min. C — 11.8 fl. oz./min. D — 12.7 fl. oz./min. E — 11.5 fl. oz./min. F — 11.8 fl. oz./min.
Avg. = 12.0 **5% of Avg. = .6** **Nozzle D is the only nozzle that is 5% more or less than the average.**	81. Dusters and granular applicators that are applying more or less than ______ % of the recommended dosage should be recalibrated.
5%	You have just completed Chapter 5, Use and Maintenance of Pesticide Application Equipment. Now complete the Post Test found in the back of this Chapter.

CHAPTER 5

USE AND MAINTENANCE OF PESTICIDE APPLICATION EQUIPMENT

POST TEST

Answer the following true or false:

1. A change in sprayer pressure will change the flow rate but will not affect the nozzle patterns or spray droplet size.

   A. true
   B. false

2. In order to properly make emergency repairs in the field, the operator of the sprayer should dismount and remove his gloves and protective mask before working on the sprayer.

   A. true
   B. false

3. Sprayers should be calibrated by spraying pesticide formulation.

   A. true
   B. false

4. If you are calibrating a sprayer that has a 200 gallon capacity, you should spray an area large enough to use at least 20 gallons.

   A. true
   B. false

5. The best source of equipment operating information is from the operator's manual.

   A. true
   B. false

6. Nozzles that have a faulty spray pattern should be replaced.

   A. true
   B. false

Answer the following multiple choice questions:

7. Which of these can be used to clean nozzles?

   A. clean knife.
   B. screw driver.
   C. heavy gauge steel wire.
   D. wooden toothpick or toothbrush.

8. If the sprayer nozzles clog during spraying, the operator should:

   A. increase pressure to break the clog.
   B. stop the sprayer immediately, and unclog the nozzles before doing anything else.
   C. turn the sprayer off and move it to the edge of the field before attempting to work on it.
   D. continue spraying if enough nozzles are working. Fix the sprayer when all of the spray has been applied.

9. A sprayer is calibrated to apply 10 gallons per acre at a pressure of 20 psi. What pressure would be required to increase the output to 20 gallons per acre without changing the speed of travel or nozzle size?

   A. 40 psi
   B. 60 psi
   C. 80 psi
   D. None of these. A change in pressure could not be used to produce that large a change in sprayer output.

10. What is the best method to insure proper mixing of a wettable powder formulation?

    A. Add the pesticide, then stir the mixture as the tank fills.
    B. Make a slurry, and pour it into a partly filled tank before filling the tank. Agitate as the tank is filled.
    C. Fill the tank to 1/3 full of water, add the wettable powder, agitate and fill to capacity.
    D. Mix in a barrel until the powder and water are thoroughly mixed, then add to a full tank of water under agitation.

11. A sprayer is calibrated to apply 20 gallons per acre (gpa) at a speed of 4 miles per hour.

    What would be the application rate if the sprayer were slowed to 2 miles per hour?

    A. 5 gpa
    B. 10 gpa
    C. 40 gpa
    D. There would be no change in application rate.

12. At which of the following amounts per acre should you stop and recalibrate your granular applicator if you need a recommended dosage of 7 pounds per acre?

    A. 6.3 lb. per acre.
    B. 6.8 lb. per acre.
    C. Both of these would require recalibration.
    D. Neither of these. They are both within the 5% limit so that recalibration is unnecessary.

13. In calibrating your sprayer with a 100 gallon capacity, you poured 6¼ gallons of water back into the tank to fill it after spraying ¼ of an acre.

    What is the spray rate in gallons per acre of your sprayer?

    A. 18¾ gpa
    B. 15¼ gpa
    C. 6¼ gpa
    D. 25 gpa

14. Your sprayer has 6 nozzles. In a one minute flow check you find the flow rates as shown below. Which of these nozzles will have to be replaced? (Choose all that apply.)

NOZZLE	FLOW RATE (in fluid oz./min.)
A	8.0
B	7.5
C	8.2
D	7.8
E	8.3
F	8.2

Problems – Fill in the blanks:

15. Your spray tank holds 200 gallons of spray. During calibration, you had to replace 8 gallons of water after spraying one acre.

This sprayer applies at a rate of ________________ gpa.

A tank full of spray will cover ________________ acres.

Label directions on a can of emulsifiable concentrate tell you to apply 2 pints of the formulation per acre. How many pints should you add to one tank load?

________________ pints

16. A sprayer with a 200 gallon tank is calibrated to apply 40 gallons per acre.

To apply 2 pounds of active ingredient per acre of a 50% wettable powder, you will need to add how many pounds of pesticide formulation into the tank?

A full tank will cover ________________ acres.

This will require ________________ pounds of active ingredient per tank.

You must add ________________ pounds of 50% wettable powder formulation per tankful.

CHAPTER 6

USING PESTICIDES SAFELY

PRE TEST

Answer the following questions true or false:

1. Complete directions for using a pesticide are found on the label of the pesticide container.
   - A. true
   - B. false

2. Severe pesticide poisoning cannot occur unless a pesticide is eaten.
   - A. true
   - B. false

3. A sweat suit offers good protection when working with highly toxic pesticides because the material is very absorbent.
   - A. true
   - B. false

4. A "gas mask" or chemical canister respirator can be used for fumigation work.
   - A. true
   - B. false

5. A filter on a cartridge respirator does not need changing as frequently as the filter on a canister respirator.
   - A. true
   - B. false

6. Symptoms of most pesticide poisoning may take 24 hours to develop.
   - A. true
   - B. false

7. If pesticide poisoning is suspected, the first thing that should be done is to induce vomiting in the victim.
   - A. true
   - B. false

Answer the following questions multiple choice:

8. Pesticides should be stored:
   - A. in clearly marked containers.
   - B. only in the original container.
   - C. Both of the above.

9. Pesticides can cause poisoning when they are:
   - A. breathed in.
   - B. eaten.
   - C. touched.
   - D. Any of the above.

10. Which of the following would be better head protection during the application of pesticide?

A. close-fitting cap like those worn by surgeons.
B. a cap with a long visor.
C. a construction worker's hard hat.
D. Any of the above.

11. Which would be better body protection when working with highly toxic pesticides?

A. cotton coveralls.
B. water-proof raincoat.
C. blue jeans and knit shirt.

12. Which of the following would provide the best protection for the feet?

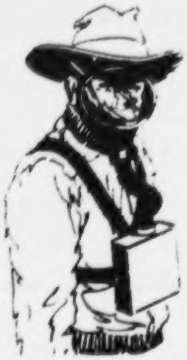
A. sneakers and heavy wool socks.
B. high-top leather shoes.
C. unlined neoprene boots.
D. Any of the above.

13. Materials worn to protect the body while using pesticides should be:

A. highly absorbent.
B. non-absorbent.

14. This is a:

A. cartridge respirator.
B. self-contained breathing apparatus.
C. gas mask.



15. Respirators should be approved by:

A. National Institute for National Safety and Health.
B. Mining Enforcement and Safety Administration.
C. Environmental Protection Agency.
D. A and B, but not C.

16. Clothing used for pesticide work:

A. should be dry cleaned.
B. washed in detergent.
C. washed in soap.

17. Pesticides are best washed off the body with:

A. soap and water.
B. detergent and water.
C. baking soda and water.
D. solvent.

18. When a pesticide is swallowed:

- A. you should see a doctor right away.
- B. induce vomiting.

19. How often should you clean your clothing, goggles and respirator face mask used during pesticide application?

- A. about once a week.
- B. about once a month.
- C. after each use.
- D. when they get dirty.

Fill in the blanks.

20. When taking a patient to a doctor you should take the pesticide ______________ with you.

21. Pesticide poisoning symptoms will usually occur within ______________ hours of exposure.

CHAPTER 6

USING PESTICIDES SAFELY

LEARNING PROGRAM

1. Most pesticides can cause severe illness or even death if misused. However, registered pesticides can be used safely if correct procedures are followed.

   This chapter will cover how to protect yourself during pesticide application and what to do in case of poisoning.

   GO ON TO THE NEXT FRAME

---

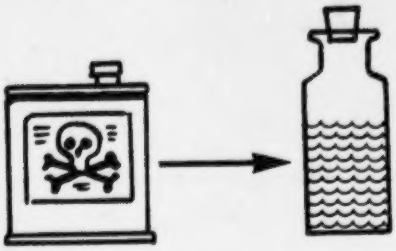
2. You can avoid trouble with pesticides if you first read the directions for use.

   This information can be found on the pesticide ______________.

---

label

3. The pesticide label is important.



   What if the pesticide were put in a new container? Would you have access to the original label instructions? (yes/no)

---

no

4. Is it possible to mistake pesticide stored in a food container as something to eat or drink? (yes/no)

---

yes

5. Pesticides should be:

   A. kept in original containers.
   B. Transferred to new containers after they have been opened.

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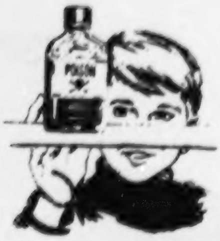
6

[illegible]inal containers.

6.



Pesticides should also be stored away from ______________ and untrained persons.

---

7. To prevent accidents with pesticides you should:

Take care to follow directions on the ______________.

Keep pesticides in their original ______________.

Use and store pesticides away from ______________.

POISONING

8. Most deaths caused by pesticides occur when a person accidently eats or drinks the product.

This may occur because the pesticide was placed in an unmarked container.

However, there is a more subtle way this can happen. If a person gets pesticides on his hands during application, could he get the product into his mouth? (yes/no)

Yes! He could touch the food he is eating, touch cigarettes, bite his nails, etc.

9. A person can also get a pesticide into his body by breathing it in, or getting it on his skin. Most pesticides can get into the body through the skin.

You can be poisoned from a pesticide by:

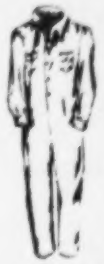
A. breathing it.
B. eating it.
C. touching it.
D. Any of these.

D
Any of these.

10. Therefore, during the application of a pesticide, you should not:

A. breathe pesticide mist, dust or vapor.
B. allow it on your skin.
C. get it on your hands.
D. All of these.

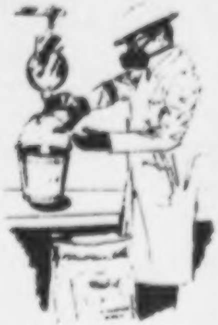
PROTECTING YOUR BODY FROM PESTICIDES

D **All of these.**	11. In general, the more of your body covered during the application of pesticides the better. Even in hot weather, when applying pesticides you should wear (long/short) sleeved shirts and (long/short) pants.
long long	12.  A coverall type of garment as shown above (would/would not) be good for pesticide application.
would	13. For increased protection, the material in protective garments should be: A. loosely woven and absorbent. B. tightly woven and non-absorbent.
B **tightly woven and non-absorbent.**	14. Which of these materials would be good for pesticide work? blue jean denim knit shirt "see through" material cotton as found in work shirts
blue jean denim. **cotton as found in work shirts.**	15. In addition, when working with highly toxic or highly concentrated pesticides, you should be covered with something: A. waterproof. B. absorbent.
A **waterproof.**	16. Which of these would be better to wear when working with highly toxic pesticides or pesticide concentrates? A. rain coat. B. sweat shirt.

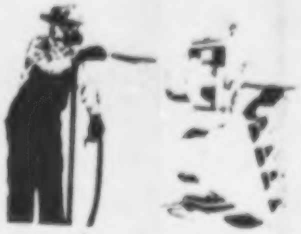
A
rain coat.

17. Which man is wearing better protection for working with highly toxic materials?

A.

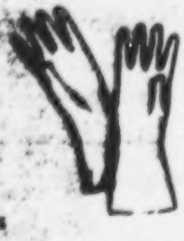


B



A

18. To protect hands from pesticides, the applicator should wear ________________.



gloves
(These gloves should be long enough to protect the wrist).

19. The applicator will be safer if the glove material is made from (absorbent/non-absorbent) material.

---

non-absorbent

20. For most pesticides, gloves should be made from:

A. neoprene rubber.
B. cotton.
C. leather.
D. Any of these.

A
neoprene rubber.
This is the only material listed that is non-absorbent.

(Cotton or leather gloves may be used only if the label directions instruct you to.)

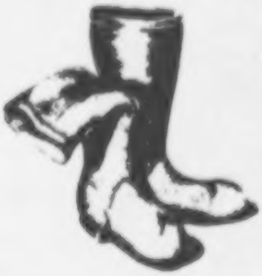
21. Gloves lined with a fabric are absorbent and could hold pesticide against your skin.

Therefore, neoprene gloves used in pesticide work should be (lined/unlined).

unlined

22. Like gloves, boots used in pesticide application should be made from:

A. unlined neoprene.
B. cotton and leather.

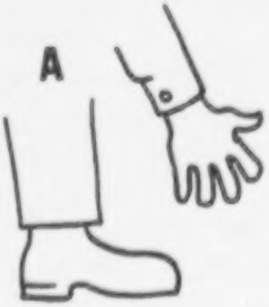


A
unlined neoprene.

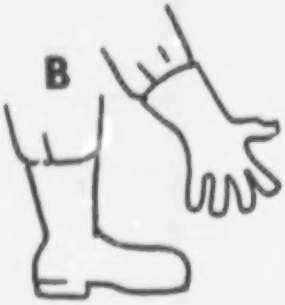
23. To prevent a pesticide from getting into your gloves and boots, pant legs and shirt sleeves should be worn *outside* your gloves and boots.

This is shown correctly in which picture?

A

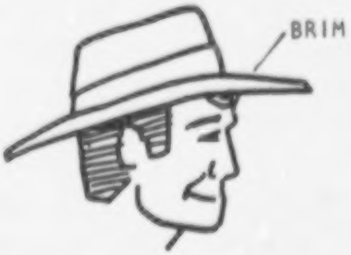


B



A

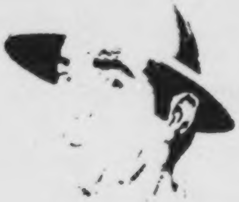
24. The head, neck and face can be protected by wearing a hat.



The neck and face are protected by the ______________ of the hat.

brim

25. The hat worn during pesticide application should have a (wide/narrow) brim.



[illegible]

26. The hat should also be (waterproof/absorbent).

---

waterproof

27. Which of these would be a good hat for pesticide work?

plastic hard hat
rain hat
baseball cap
straw hat
felt hat

---

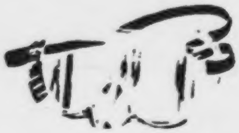
plastic hard hat.
rain hat.

28. The sweatband in the hat should be:

A. absorbent material.
B. plastic

B
plastic.

29.



The eyes must be protected from pesticides by wearing ____________ or a face mask.

---

goggles

30. Again, absorbent head bands on goggles should be avoided.

Which of these would be better on goggles used in pesticide work?

A. elastic fabric headbands.
B. neoprene headbands.

[redacted]

RESPIRATORY DEVICES

31. The applicator's breathing must be protected during the handling of a pesticide.

Pesticide dusts and sprays may consist of:

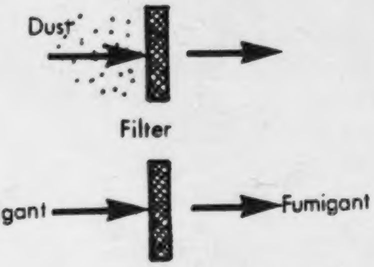
A. gases (vapors).
B. small particles or droplets.
C. Both of the above.

---

32. Therefore, sprays, dusts and vapors (can/cannot) be filtered out of the air.

---

33. Respirators are filtering devices that screen out and trap droplets, dust particles and vapors before they are breathed in.



Respirators can be used to protect the wearer against:

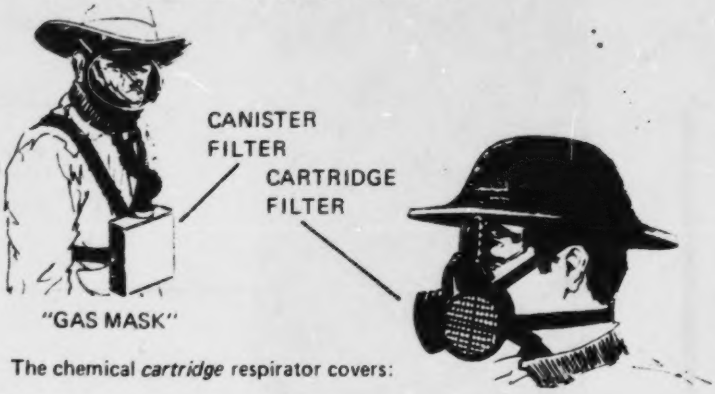
A. pesticide dusts, sprays and vapors.
B. fumigants.
C. Both of these.

---

34. The only types of respirators you should use when applying pesticides are those approved by the National Institute for National Safety and Health (NIOSH) and the Mining Enforcement and Safety Administration (MESA).

GO ON TO THE NEXT FRAME

35. The pictures below show 2 types of respirators.



The chemical *cartridge* respirator covers:

A. nose and mouth only.
B. eyes, nose and mouth.

---

36. The chemical ________________ respirator uses a face mask that covers the whole face.

---

37. Which type of respirator requires the user to wear separate goggles?

A. chemical cartridge respirator.
B. chemical canister respirator.

---

38. Which type is also called a "gas mask"?

A. chemical cartridge respirator.
B. chemical canister respirator

---

39. Which respirator has the larger filter element?

A. chemical cartridge respirator.
B. chemical canister respirator.

B

[illegible] respirator.

A

chemical canister respirator.

B

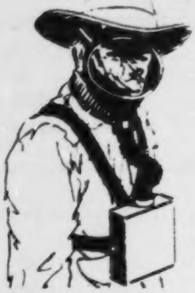
chemical cartridge respirator.

B

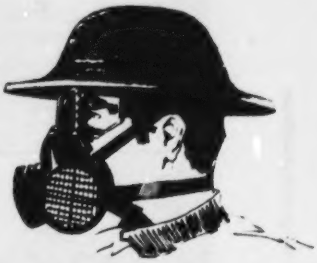
C

Both of these.

40. Label these pictures as chemical cartridge or canister respirators.



A. ________________



B. ____________________________

41. Filters:

A. can last indefinitely.
B. fill up and must be replaced.

42. When working with pesticides, the cartridges and canisters on chemical respirators must be changed every day or more often if you can smell chemical vapors.

How often do you change cartridges and canisters?

A. every day.
B. if you can smell chemical vapors.
C. Both of these.

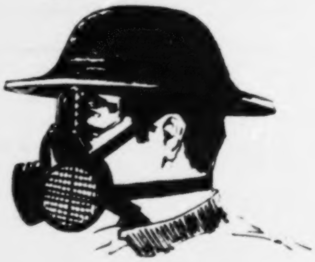
43. Used cartridges and canisters contain pesticide. Therefore, these filters:

A. can be thrown in the trash.
B. must be disposed of as directed for the pesticide.

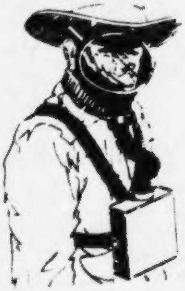
44. Respirators can only filter air. They cannot supply you with oxygen.

If oxygen is low or where fumigants are used, which of these devices can protect the wearer best?

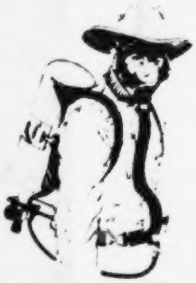
A.



B.



C.



CARE AND CLEANING OF PROTECTIVE CLOTHING AND RESPIRATORS

C [illegible] its own air supply.	45. Clothing can collect pesticides. To prevent a dangerous build-up, clothing used for pesticide work should be cleaned: A. after each use. B. when it gets dirty.
[illegible] each use.	46. If you spill a pesticide on your clothing you should: A. wait until the end of the job to change your clothes. B. change your clothes right away.
B [illegible] your clothes right [illegible]	47. Pesticide concentrates are particularly hard to remove from clothing. If your clothing gets wet from pesticide concentrates or highly toxic pesticides, it should be (washed/destroyed).
destroyed	48. In any event, because of the pesticide hazard, contaminated clothing (can/should not) be stored or washed with the family wash.
should not.	49. Detergent is better at removing pesticides than soap. Clothing used in pesticide work should be washed with ______________.
detergent	50. The face piece of the respirator and goggles must be washed: A. after each use. B. when they get dirty.
A after each use.	51. Wash the face piece with detergent and water, rinse it and dry it with a clean cloth. The respirator should be stored in a clean, dry place away from pesticides. A good place to store the respirator is. A. where your protective clothing is stored. B. next to the pesticide containers.
A [illegible] protective clothing is stored.	52. You should be sure that the respirator fits your face. Long sideburns, glasses, beards, etc. can: A. make a good seal. B. prevent the respirator from sealing.

53. To review what we have covered so far:

The purpose of protective clothing and respirators is:

A. to keep you from breathing pesticide.
B. to keep pesticide away from your skin.
C. to keep the pesticide off of your hands.
D. All of these.

---

54. Protective clothing should be made from (loosely/tightly) woven fabric.

---

55. Which of these is a better hot weather outfit for pesticide work?

A. knit shirt and light cotton pants.
B. coverall garment of tightly woven cotton.

---

56. If you are handling highly toxic or concentrated pesticides, your outer garment should be:

A. overalls.
B. a raincoat.

---

57. Which of these is a better head covering for applying pesticides?

A. scarf.
B. baseball cap.
C. plastic hard hat.

---

58. Unless otherwise specified by the label, gloves and boots used for pesticide application should be:

A. canvas or leather.
B. lined neoprene.
C. unlined neoprene.
D. Any of these.

---

59. You will need to wear goggles with a chemical ______________ respirator.

A chemical ______________ respirator is also called a "gas mask".

---

60. How often should protective clothing, goggles and respirators be washed?

____

after each use.

61. Goggles and respirators should be washed with detergent, and then

A. air dried.
B. wiped dry with a clean cloth.

B
[illegible] dry with [illegible] cloth

62. The respirator type you use for pesticide work should be one approved by:

A. NIOSH.
B. The Mining Enforcement and Safety Administration.
C. Both of these.

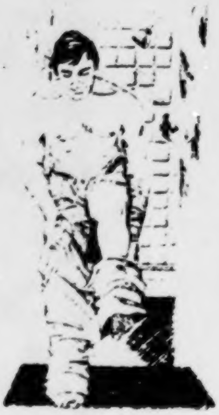
C
Both of these.

FIRST AID

63. Pesticides can be washed off your body.

After applying pesticides you should wash using:

A. detergent and water.
B. soap and water.



A
detergent and water.

64. If you get pesticide on your skin, remove it as quickly as possible by washing with ________________ and water.

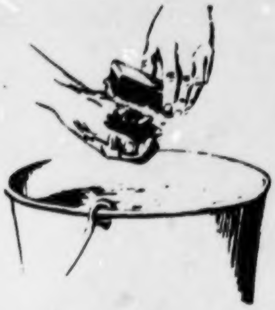
---

detergent

65. Prompt washing may prevent sickness even when the spill is very large.

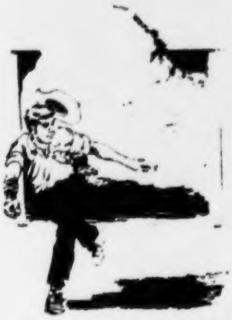
Therefore, the first thing you should do after a spill is ________________ with ________________ and water.

66. Hair and fingernails are places where pesticides may be difficult to wash off.



In case of contact with pesticides, you should pay careful attention to washing your hair and under your ________________.

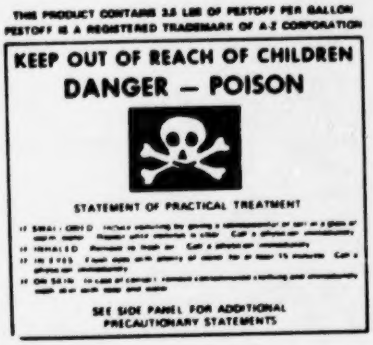
67.



fingernails

If you inhale a pesticide, get to fresh ________________ immediately.

68.



THIS PRODUCT CONTAINS 3.5 LBS OF PESTOFF PER GALLON
PESTOFF IS A REGISTERED TRADEMARK OF A-Z CORPORATION

KEEP OUT OF REACH OF CHILDREN
DANGER – POISON

STATEMENT OF PRACTICAL TREATMENT

SEE SIDE PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS

air

If you have inhaled a pesticide, you should at least contact a ________________.

69. If you splash a pesticide into your mouth or swallow it, rinse your mouth out with several glasses of ________________.

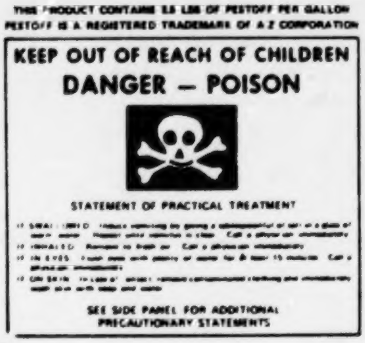
70. If there is any chance that you swallowed pesticide, you should:

A. wait to see if you get sick.
B. get to or be taken to a doctor right away.

71. Sometimes it is much safer for the victim to be made to vomit up the pesticide.

Other times the pesticide is so caustic that it will damage the mouth and throat if it is vomited. It is safer to leave in the stomach.

[illegible] to a doctor [illegible]



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KEEP OUT OF REACH OF CHILDREN
DANGER – POISON

STATEMENT OF PRACTICAL TREATMENT

SEE SIDE PANEL FOR ADDITIONAL
PRECAUTIONARY STATEMENTS

Instructions as to whether the victim should be made to vomit can be found on the pesticide ________________.

72. If a person has been poisoned, his symptoms must be watched constantly, or he may die.

A person who has been poisoned (should/should not) be left alone.

should not.

73. If you have to go for a doctor, the poison victim should be:

A. left in a quiet place.
B. left with someone else to watch him.

[illegible] else to

74. The pesticide label gives specific instructions to the doctor on how to treat the poison victim (for example).

PRECAUTIONARY STATEMENTS

DANGER

HAZARDS TO HUMANS
(& DOMESTIC ANIMALS)

Poisonous by swallowing or inhalation. Do not breathe spray mist. Do not get in eyes. Avoid contact with skin. Wear a mask or respirator of a type passed by the U. S. Bureau of Mines for De Pesto protection. For emergency assistance call 000-000-0000
TO PHYSICIAN: De Pesto is a reversible cholinesterase inhibitor. Do not use oximes such as 2-PAM. Give Atropine 2mg. intravenously or subcutaneously. If in eye instill one drop of Homatrophine.

If you take a person to the doctor because of suspected pesticide poisoning, the doctor will need the pesticide ________________.

---

label

75. Therefore, the pesticide label or the container should be taken to the doctor.

If the container must be carried, it should be taken in:

A. the trunk or back of the truck.
B. the back seat.

A
[illegible] trunk or back of the [illegible]

76. It is a good idea to carry the pesticide container in the passenger section of a car or truck? (yes/no)

---

no

SYMPTOMS OF PESTICIDE POISONING

77. Pesticide poisoning symptoms rarely appear more than 12 hours after exposure.

Sickness that occurs more than 12 hours after pesticide treatment probably (is/is not) due to pesticide poisoning.

---

is not

78. Even with illness that occurs more than 12 hours after possible pesticide exposure, is it a good idea to check with a doctor anyway? (yes/no)

yes	79. One type of poisoning is due to pesticides like parathion. These pesticides injure the nervous system. Parathion poisoning would more likely produce which of these symptoms: A. dizziness. B. skin blisters.
A **dizziness.**	80. Exhibit in the back of this Chapter shows the levels of symptoms produced by parathion poisoning or poisoning by similar pesticides. Symptoms of poisoning occur in stages. You can expect a poison victim to: A. get mild symptoms first. B. drop over immediately with severe symptoms.
A **get mild symptoms first.**	81. There are 3 stages of poisoning: mild, moderate and severe. Which of these symptoms will appear first? A. muscle twitches and unconsciousness. B. sweating, nausea and stomach cramps.
B **sweating, nausea and stomach cramps.**	82. During moderate and severe stages of pesticide poisoning, the symptoms (such as headache and dizziness) that first appeared during the mild stage: A. disappear. B. get worse.
B **get worse.**	83. Another example of pesticide poisoning is with fumigants and solvents. This type of poisoning will occur when a person (eats/breathes) the pesticide.
breathes	84. The signs and symptoms of fumigant or solvent poisoning are: poor coordination slurred words confusion sleep A person who has been poisoned by fumigants appears drunk. GO TO THE NEXT FRAME

85. A person who has been poisoned by breathing fumes from solvents more likely will:

A. develop a quick heartbeat.
B. get sick to his stomach.
C. get sleepy.

C
get sleepy.

REVIEW AND SUMMARY

86. To prevent accidents with pesticides you should:

Take care to follow directions on the ________________.
Keep pesticides in their original ________________.
Use and store pesticides away from ________________.

---

label
containers
children, or untrained persons.

87. Protective clothing should be designed to:

A. keep you from breathing pesticides.
B. keep pesticides off your skin.
C. keep pesticides off your hands.
D. All of the above.

D
All of the above.

88. To keep pesticides off and out of your body, protective clothing should be (absorbent/non-absorbent).

---

non-absorbent.

89. Gloves and shoes should be made of ________________.

---

neoprene rubber.

90. Hats should protect the head from pesticides.

Hats should be non-absorbent and have a ________________ all around.

---

brim

91. Respirators protect you from breathing in chemical dusts.

The dust is trapped by a ________________ which is part of the respirator unit.

---

filter

92. To provide constant protection, a respirator must be cleaned and the filter changed periodically.

The respirator should be washed ________________ ________________.

after each use.	93. Canister filters need changing ______________ day of use. Cartridge filters need changing ______________ day of use.
every **every**	94. The most effective cleaning agent for clothes, equipment and the body is (soap/detergent) and water.
detergent	95. If you swallow or breathe in a pesticide you should see a doctor. To help the doctor determine the proper treatment, you should bring the pesticide ______________ with you.
label **(if the label is not available you should bring the container).**	96. Since some of the symptoms of pesticide poisoning are so severe—for example, unconsciousness—the poison victim should be watched carefully. He or she (should/should not) be left alone.
should not	97. The symptoms of pesticide poisoning usually occur within ______________ hours of exposure.
12 hours	98. The first symptoms are mild and they get progressively worse. Which of these would be a mild symptom of pesticide poisoning? A. loss of consciousness. B. vomiting and diarrhea.
B **vomiting and diarrhea.**	99. Pesticides like parathion affect the nervous system. A symptom of parathion poisoning might be: A. dizziness. B. skin blisters.
A **dizziness.**	100. Circle the symptoms that might occur in the severe stage of pesticide poisoning. unable to walk difficulty in breathing secretions from the mouth vomiting loss of consciousness

[redacted]

101. Fumigants and solvents poison when they are (swallowed/breathed in).

102. A person with fumigant or solvent poisoning might appear to be drunk.

He or she will be more likely to (vomit/get sleepy and confused).

You have now completed Chapter 6, Using Pesticides Safely. Now complete the post test found in the back of this Chapter.

CHAPTER 6

USING PESTICIDES SAFELY

POST TEST

Answer the following questions true or false:

1. Complete directions for using a pesticide are found on the label of the pesticide container.

   A. true
   B. false

2. Severe pesticide poisoning cannot occur unless a pesticide is eaten.

   A. true
   B. false

3. A sweat suit offers good protection when working with highly toxic pesticides because the material is very absorbent.

   A. true
   B. false

4. A "gas mask" or chemical canister respirator can be used for fumigation work.

   A. true
   B. false

5. A filter on a cartridge respirator does not need changing as frequently as the filter on a canister respirator.

   A. true
   B. false

6. Symptoms of most pesticide poisoning may take 24 hours to develop.

   A. true
   B. false

7. If pesticide poisoning is suspected, the first thing that should be done is to induce vomiting in the victim.

   A. true
   B. false

Answer the following questions multiple choice:

8. Pesticides should be stored

   A. in clearly marked containers.
   B. only in the original container.
   C. Both of the above.

9. Pesticides can cause poisoning when they are:

   A. breathed in.
   B. eaten.
   C. touched.
   D. Any of the above.

10. Which of the following would be better head protection during the application of pesticide?

- A. close-fitting cap like those worn by surgeons.
- B. a cap with a long visor.
- C. a construction worker's hard hat.
- D. Any of the above.

11. Which would be better body protection when working with highly toxic pesticides?

- A. cotton coveralls.
- B. water-proof raincoat.
- C. blue jeans and knit shirt.

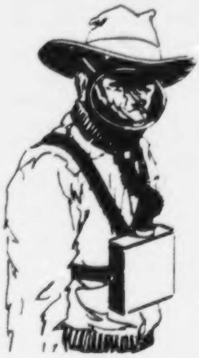
12. Which of the following would provide the best protection for the feet?

- A. sneakers and heavy wool socks.
- B. high-top leather shoes.
- C. unlined neoprene boots.
- D. Any of the above.

13. Materials worn to protect the body while using pesticides should be:

- A. highly absorbent.
- B. non-absorbent.

14. This is a:



- A. cartridge respirator.
- B. self-contained breathing apparatus.
- C. gas mask.

15. Respirators should be approved by:

- A. National Institute for National Safety and Health.
- B. Mining Enforcement and Safety Administration.
- C. Environmental Protection Agency.
- D. A and B, but not C.

16. Clothing used for pesticide work:

- A. should be dry cleaned.
- B. washed in detergent.
- C. washed in soap.

17. Pesticides are best washed off the body with:

- A. soap and water.
- B. detergent and water.
- C. baking soda and water.
- D. solvent.

18. When a pesticide is swallowed:

A. you should see a doctor right away.
B. induce vomiting.

19. How often should you clean your clothing, goggles and respirator face mask used during pesticide application?

A. about once a week.
B. about once a month.
C. after each use.
D. when they get dirty.

Fill in the blanks.

20. When taking a patient to a doctor you should take the pesticide ______________ with you.

21. Pesticide poisoning symptoms will usually occur within ______________ hours of exposure.

MILD POISONING

- Fatigue
- Headache
- Dizziness
- Blurred Vision
- Too much Sweating and Salivation
- Nausea and Vomiting
- Stomach Cramps or Diarrhea

MODERATE POISONING

- Unable to Walk
- Weakness
- Chest Discomfort
- Muscle Twitches
- Constriction of Pupil of the Eye
- Earlier Symptoms Become more Severe

SEVERE POISONING

- Unconsciousness
- Severe Constriction of Pupil of the Eye
- Muscle Twitches
- Secretions from Mouth and Nose
- Breathing Difficulty
- Death if not Treated

CHAPTER 7

THE ENVIRONMENT AND THE LAW

PRE TEST

Answer the following questions true or false:

1. Using pesticides in a way other than as directed on the label is a violation of *Federal* Law.

   A. true
   B. false

2. In order to reduce the vaporization of pesticides, you should apply them in the *cool* part of the day.

   A. true
   B. false

3. Farm produce coming to market should have *no* pesticide residue on or in it.

   A. true
   B. false

4. Tolerance levels are given in parts per million.

   A. true
   B. false

5. Pesticides should be mixed and loaded out of doors in daylight.

   A. true
   B. false

6. Pesticide containers can be reused to store other chemicals, but only if they have been thoroughly cleaned.

   A. true
   B. false

7. When mixing pesticides, you should work alone so as to reduce the chance of an accident.

   A. true
   B. false

8. One good way to clean up a pesticide spill is by soaking the pesticide up in sawdust or soil and shoveling it into leakproof containers.

   A. true
   B. false

9. Pesticide drift can be reduced by reducing sprayer pressure.

   A. true
   B. false

10. Empty pesticide containers can be disposed of by burying.

- A. true
- B. false

11. Small numbers of paper pesticide containers may be burned if local regulations allow it.

- A. true
- B. false

12. If a spill occurs on a public street or road, you should contact the local authorities before doing anything else

- A. true
- B. false

13. A barn is a good storage place for pesticides if the pesticides have their own special storage area.

- A. true
- B. false

Answer the following multiple choice questions:

14. If you have a pesticide left over and cannot reuse it, the excess can be.

- A. washed down a drain with a large quantity of water.
- B. buried in a hole at least 18 inches deep.
- C. placed in a special landfill area.
- D. taken to the local dump.

15. Restricted use pesticides can only be legally used by:

- A. certified applicators.
- B. private applicators.
- C commercial applicators.
- D. Any of these.

16. The safest place to transport pesticides is in the back of a:

- A. pickup truck.
- B. paneled truck.
- C. covered jeep.
- D. station wagon.

17. Pesticides should be transported and stored in:

- A. a special sealed container.
- B. sprayer tanks.
- C. the original container.
- D. Any of these.

18. Which of these is the best building material for a pesticide storage building?

- A. wood and shingle.
- B. plywood.
- C. sheet metal.
- D. brick.

19. If strong winds come up during pesticide application:

A. stop immediately.
B. finish the job, but at a slower pace.
C. finish the job, but at a lower sprayer pressure.
D. continue the application unless drift becomes a problem.

20. Match the following:

A. Tolerance ______
B. Persistent pesticide ______
C. Accumulative pesticide ______
D. Residue ______
E. EPA ______
F. ppm ______
G. Label ______
H. Drift ______
I. Target ______

1. Long-lived pesticide.
2. Area or pest to be treated for.
3. Pesticide that can build-up inside the body.
4. First source of information on pesticide restrictions, quantities for treatment, dates for treatment before harvest, etc.
5. Movement of dust or spray on air currents.
6. Pesticide left on produce.
7. Measure of pesticide residue on produce.
8. Safe level of residue on produce.
9. Agency that sets tolerance levels.

Fill in the blanks:

21. Some ways pesticides can move out of a target area are:

A. they can ______________ in hot weather.
B. they can be eroded along with ______________ particles.
C. they can leach through the soil into ground ______________.

22. A pesticide storage building should:

A. have a ______________ floor.
B. be built from ______________ -proof materials.
C. have a ______________ on the door.
D. be well ______________, and well ventilated.

CHAPTER 7

THE ENVIRONMENT AND THE LAW

LEARNING PROGRAM

1. In recent years there has been increasing concern as to the effects pesticides have on people and their surroundings.

The use and misuse of some pesticides has resulted in the passage of laws regulating pesticide use.

GO ON TO THE NEXT FRAME

---

2. Pesticides can kill wildlife, contaminate drinking water, poison domestic animals and plants, and poison people. However, if pesticides are used correctly, all of these problems can be reduced.

This chapter will cover: (1) how pesticides can threaten the environment, (2) procudures for preventing environmental damage, (3) safe handling of pesticides, and (4) what laws may affect you in your handling of pesticides.

GO ON TO THE NEXT FRAME

PESTICIDE TARGETS AND NON-TARGETS

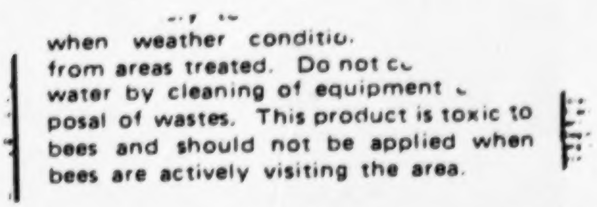
3. The *target* plant or animal is what the pesticide is designed to kill.

A likely target pest for an insecticide would be:

A. the pea aphid.
B. the honey bee.

A
the pea aphid

4. Here is a portion of a pesticide label.



when weather conditio
from areas treated. Do not c
water by cleaning of equipment
posal of wastes. This product is toxic to
bees and should not be applied when
bees are actively visiting the area.

This pesticide is designed to kill the pea aphid. However, it *will* kill:

A. the pea aphid.
B. the honey bee.
C. Both of these.

C
Both of these.

5. Unfortunately, pesticides may kill:

   A. only target plants and animals.
   B. both target and non-target plants and animals. ____

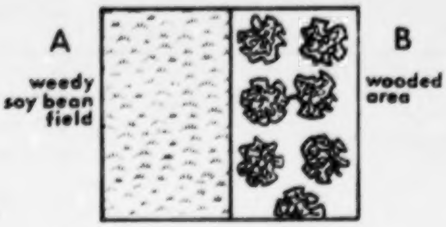
B
both target and non-target plants and animals.

6. In order to protect non-target animals such as bees, pesticides (should/should not) be applied when they are in the treatment area.

---

should not

7. Pesticides also have target *areas* on which they are to be applied.



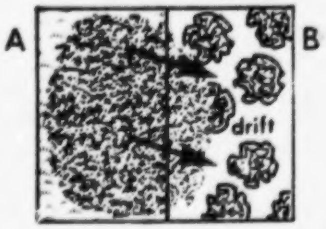
In the above area, a herbicide is going to be used to kill weeds in a soy bean field.

The target area is (A/B).

The non-target area is (A/B).

A
B

8. Drift is the movement of pesticide spray or dust out of the target area



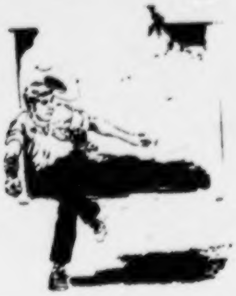
If the herbicide in the last frame drifts into the wooded area, the trees may be ____________.

---

killed or damaged

9. Drift (is/is not) desirable.

10. Wind can cause pesticide to drift out of the target area.



Pesticides:

A. can be applied in moderate or strong winds with the right precautions.
B. should not be applied in moderate or strong wind because of drift.

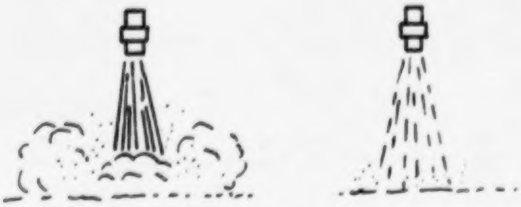
B
not be applied in mod-
strong wind because

11. If moderate to strong winds come up while you are applying pesticides, ________________ immediately.

---

stop

12. Spray pressure affects the way spray comes out of the nozzle.

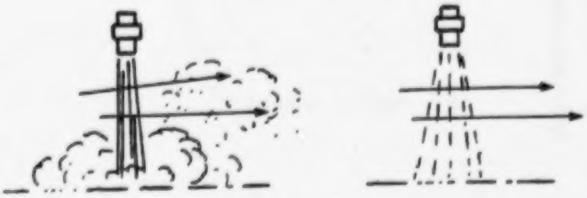


The higher the sprayer pressure, the (larger/smaller) the spray droplets.

---

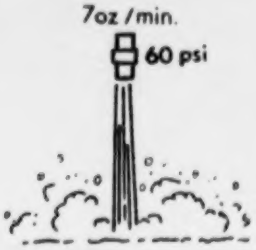
smaller

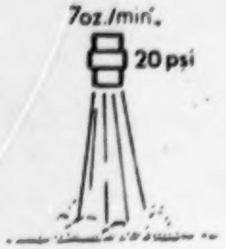
13. (Large/Small) spray droplets will drift more easily.



14. Reducing sprayer pressure and using nozzles with larger openings (increases/reduces) the possibility of drift.

smaller





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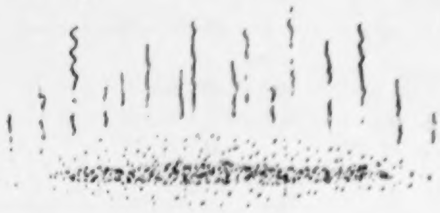
reduces

15. Pesticides can vaporize into the air.



Pesticide vapor may drift out of the target area.

GO ON TO THE NEXT FRAME

---

16. Could people or animals be poisoned by pesticide vapors? (yes/no)

---

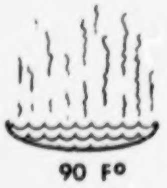
yes

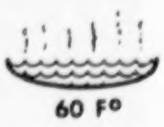
17. If possible, you should use a pesticide that (vaporizes/does not vaporize) easily.

---

does not vaporize

18.





Evaporation is less when liquids are (warm/cool).

cool

19. Therefore, to prevent pesticide vaporization, spraying should be done in the (warm/cool) part of the day.

---

cool

20. Pesticides can move out of a target area into non-target areas by:

A. ________________ produced by high sprayer pressure and small nozzle openings.

B. ________________ of pesticide into the air in hot weather.

---

drift
vaporization

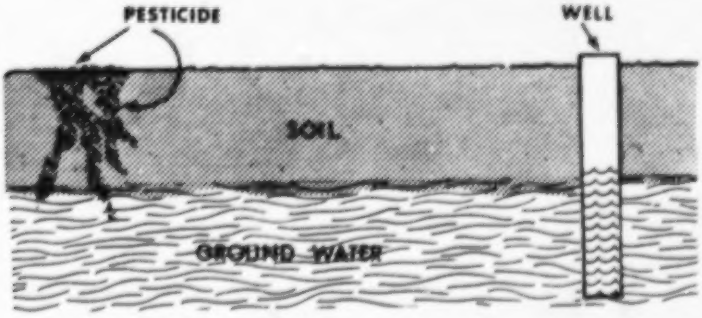
21.

Pesticide *runoff* into streams and lakes can kill ________________.

---

fish or wildlife

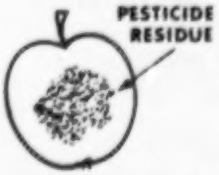
22. Pesticides can *leach* or soak through the soil and contaminate ground ________________.



---

water

23. After application, most pesticides begin to break down into harmless chemicals. The speed at which this occurs differs from pesticide to pesticide.



The pesticide left on crops or in the soil that has not broken down is called ________________.

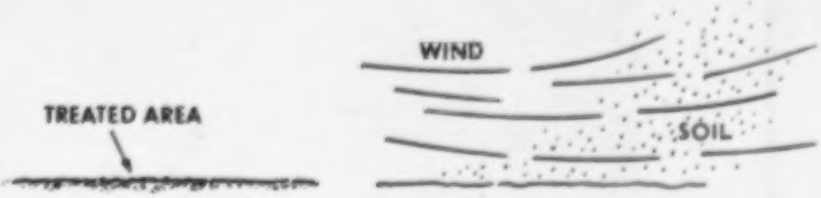
residue

24. Pesticides can be moved to where they are not wanted as a ______________ on crops.

---

residue

25. The pesticide residue in soil, even though it is not leaching into the ground water, can move.



If wind or water erosion carries the soil particles away, the pesticide ______________ will be carried with them.

---

residue

26. Some ways pesticides can move out of target areas to where they are not wanted are:

1. They can ______________ in high wind.
2. They can ______________ in hot weather and move in air currents.
3. They can ______________ into streams or lakes.

---

drift
vaporize
run off

27. (Continued from last frame.)

4. They can ______________ through soil into the ground water.
5. They can be eroded along with ______________ particles.
6. They can be carried on harvested crops as ______________.

---

leach or soak
soil
residue

PESTICIDE RESIDUES

28. Ideally, harvested crops will have no pesticide residues on them. However, in practice, this is almost impossible.

The Federal Food, Drug, and Cosmetic Act gives the Environmental Protection Agency the authority to set safe limits on the amount of residue on farm products.

The EPA:

A. requires that there be no residues on farm products going to market.
B. sets limits on how much residue will be allowed on products going to market.

8

ts limits on *how much* residue will be allowed on products going to market.

29. The amount of pesticide residue allowed on farm products and considered safe is called a *tolerance.*

The amount of pesticide residue on a crop when harvested must be ________________ the tolerance level set by the EPA.

---

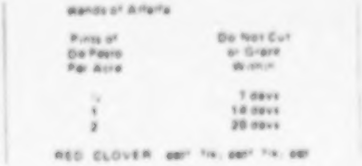
30. For most pesticides, the pesticide begins to break down right after application.

Usually, the residue will reach the tolerance level (before/after) application.

---

after

31. EPA takes into account the time it takes to break down pesticide residues. From this they compute the number of days before harvest that a crop can be safely sprayed.



This information can be found where?

____

---

on the pesticide label.

32. Tolerances are given in parts per million (or ppm). One ppm would be 1 pound of pesticide for each 500 tons of crop.

A tolerance level of 3 parts per million means that it is unsafe to have more than ________________ pounds of pesticide for every ________________ tons of farm product.

3

500

33. Suppose the tolerance level for a pesticide on cabbage is set at 5 ppm. A test reveals that there is a residue of 3.4 ppm on a shipment of cabbage.

This (is/is not) considered a safe amount.

---

34. Some pesticides persist longer than others. These are called *persistent* pesticides.

Which of these can be applied closer to harvest time?

A. a persistent pesticide.
B. a pesticide that breaks down quickly.

B
a pesticide that breaks down quickly.

35. Some pesticides are not only persistent, but they also build up in an animal.

These are called *accumulative* pesticides.

GO ON TO THE NEXT FRAME

---

36. An accumulative pesticide is a persistent pesticide that:

A. builds up in animals.
B. breaks down rapidly into harmless chemicals.

A
builds up in animals.

37. Match these:

A.	Residue	______	1.	Long-lived pesticide
B.	Tolerance	______	2.	Safe level of pesticide residue
C.	Persistent pesticide	______	3.	Pesticide left on or in farm produce
D	Accumulative pesticide	______	4.	Pesticide that can build up in animals

---

A. 3
B. 2
C. 1
D. 4

SAFE HANDLING OF PESTICIDES

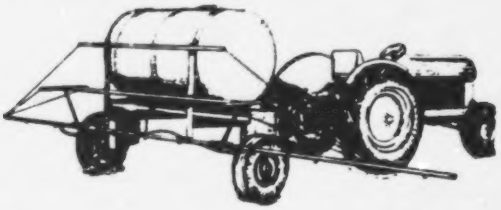
38. Many problems arise with pesticides because the handler did not think ahead at the time of purchase.

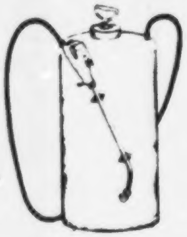
The first and most important step in planning a pesticide program is to determine:

A. where the pesticide is going to be applied.
B. what pest you need to control.

B
what pest you need to control.

39.

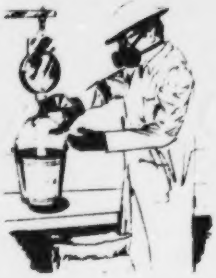




Next, the purchaser of pesticides should find out if he has the right ______________ equipment to apply that pesticide.

application

40.

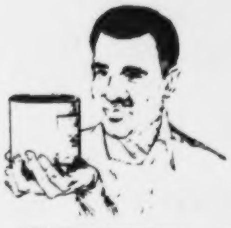


He must also know if he needs or has the correct _______________ clothing and equipment.

---

protective

41.



____

Restrictions on use, safety and environmental precautions, and the amount of pesticide needed for the job can be determined by reading the pesticide _______________.

---

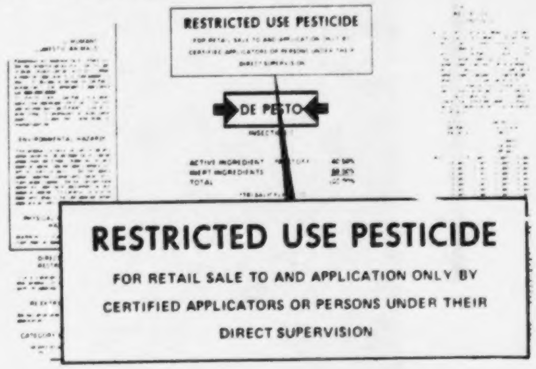
label

42. The pesticide label should be read:

- A. before purchasing the pesticide.
- B. after purchasing the pesticide.
- C. Both of these.

C
Both of these.

43. Some pesticides are for general use, and some are restricted.



RESTRICTED USE PESTICIDE

FOR RETAIL SALE TO AND APPLICATION ONLY BY
CERTIFIED APPLICATORS OR PERSONS UNDER THEIR
DIRECT SUPERVISION

This pesticide:

- A. can be used by the general public.
- B. can only be used by certified applicators.

[illegible]

44.

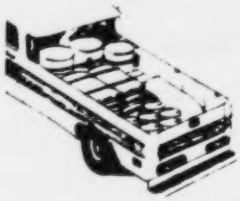
In order to purchase restricted use pesticides, you must be ______________.

---

certified

TRANSPORTATION AND STORAGE

45. Care must be taken when carrying pesticides from one place to another.



The safest place to carry pesticides is in the back of a (pick-up truck/station wagon/panel truck).

---

pick-up truck

46. Is it a good idea to carry passengers, food or animal feed with the pesticides? (yes/no)

---

no

47. When carrying or storing pesticides, you are responsible for them.

Unlocked pesticides (should/should not) be left unattended.

---

should not

48. The building storing pesticides should have a ______________ on the door.

[illegible]

49. Pesticides should be stored in a cool, dry place out of direct sunlight.

The storage building should have a (cement/dirt) floor.

---

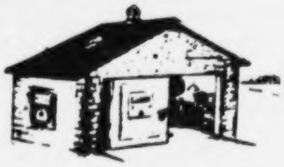
cement

50. If the building storing the pesticides caught fire, the smoke and fumes coming from the pesticides would make the fire (more/less) dangerous.

---

more

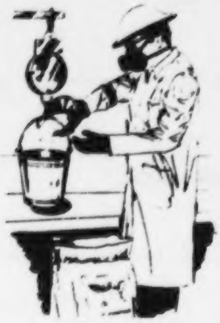
51. The storage building should be made from ______________ resistant materials.

fire	52. The pesticide storage building would be better made from: A. cinder blocks. B. wood.
A **cinder blocks**	53. Lighting and ventilation are important. To prevent accidents and mistakes when handling the pesticides, the inside of the pesticide storage building should be well ______________.
lighted	54. Pesticide fumes could build up inside the building over a period of time. Which of these would be a more sure way to clear potential fumes out of the building? A. opening the windows from time to time. B. installing an exhaust fan.
B installing an exhaust fan.	55. Pesticides should be stored in: A. new containers. B. the original labeled containers.
B the original labeled containers.	56. If a pesticide container breaks or has a leak, the pesticide should be transferred: A. to a large metal drum that can be sealed. B. to a container that held exactly the same pesticide.
B to a container that held exactly the same pesticide.	57. Identify the features of a pesticide storage building:  A. it should have a ______________ floor. B. it should be built from ______________-proof materials. C. it should have a ______________ on the door.
cement fire lock	58. Identify the features of a pesticide storage building (continued): D. it should be well ______________ and ventilated with an ______________ fan. E. food, feed or seed (should/should not) be stored in it.

[illegible]

MIXING AND LOADING PESTICIDES

59.



When mixing and loading pesticides, you should be wearing ______________ equipment and clothing.

---

protective

60. Pets, people and livestock should not be in the mixing and loading area. However, it is much safer for you to mix pesticides:

A. with someone to help you.
B. alone.

A
[illegible] someone with you.

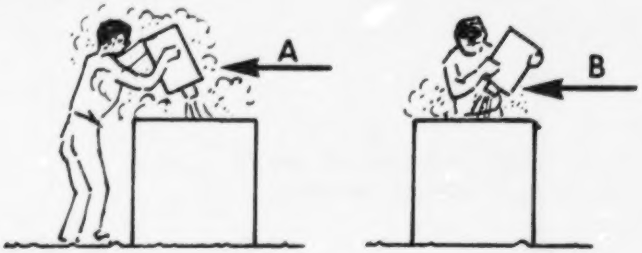
61. The safest place to mix pesticides is (outdoors/indoors).

---

outdoors

62. Wind direction is important.

You should try to mix pesticides with the wind coming from which direction? (A/B)



[illegible] ing pesticides, [illegible] wind blows [illegible] body from the [illegible] or left to avoid contaminating yourself.

If the wind comes from A, pesticide may be blown on the mixer.

63. Directions including amounts and methods may have changed since you used this type of pesticide.

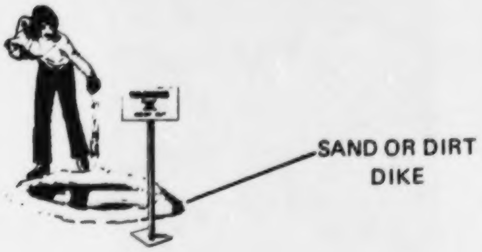
You should read label directions (before/after) opening the container.

SPILLS

64. If pesticides are accidentally spilled:

A. allow the pesticide to run off.
B. try to confine the spill.

65.



One way to confine the spill and prevent runoff is to build a dike around the spill with ________________ or ________________.

---

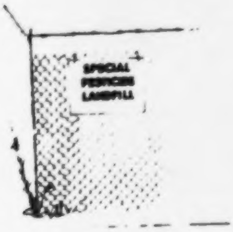
66. The pesticide may have to be removed.

It would be easier to remove the pesticide:

A. as a liquid.
B. if it is soaked up first in some material such as sawdust or soil.

---

67. Once the pesticide is soaked up, it can be shoveled into a leakproof container for disposal.



This container can be disposed of:

A. at a local dump.
B. in a special pesticide landfill.

---

68. Some arrangement (such as a fence and warning sign) must be made to keep ________________ and ________________ out of the spill area until it is cleaned up.

69. Suppose the spill occurs on a street or highway.

You should:

A. try to contain it immediately.
B. contact the proper authorities.
C. Both of these.

---

70. Match the authorities you would contact if the spill occurred on:

A. A county road ______
B. A city street ______
C. An interstate freeway ______
D. An area near a body of water ______

1. County health official
2. City police
3. Sheriff
4. Highway patrol

DISPOSAL OF EMPTY CONTAINERS

71. All pesticide containers must be destroyed or buried after use.

To prevent pesticides from contaminating the soil, glass, plastic and metal containers should be ______________ out before they are disposed of.

---

72. When emptying the pesticide container into the sprayer, you should be sure to pour out as much pesticide as possible.

You will do a better job of draining the container if you:

A. pour the pesticide into the spray tank as quickly as possible.
B. hold the pesticide container upside down an extra 30 seconds to let it drip.

---

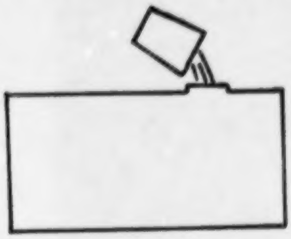
73. After pouring the pesticide into the spray tank, the container must be rinsed out.

You can get a more thorough rinse if you put water in the container, seal it, and shake it vigorously, turning it upside down.

How full should the container be with water to get a more thorough rinse?

[redacted]

74. The rinse water should then be poured into the ______________ ______________ .



---

75. The container should be rinsed:

A. once
B. at least three times.

---

76. The water used to rinse out the pesticide container should go into:

A. the sprayer tank along with the rest of the pesticide water mixture.
B. the sewer or drain.

---

77. Rinsed containers can be buried in open fields.

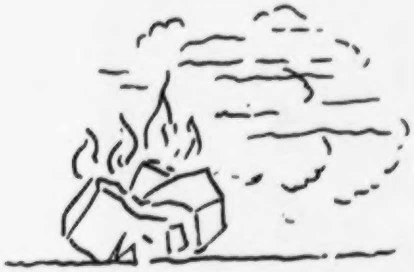
Puncture or break the containers before burying them.

The containers should be buried:

A. close to the surface.
B. at least 18 inches below the surface where they will not pollute surface or subsurface water.

---

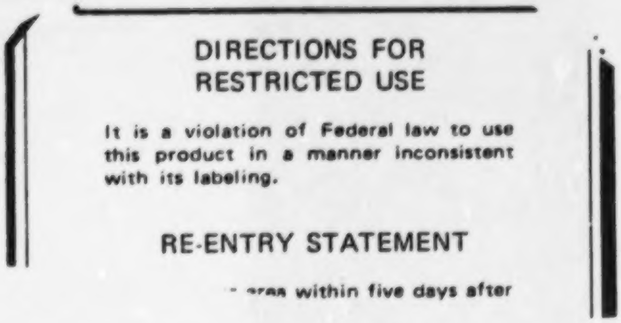
78. Small numbers of paper pesticide containers may be burned in open fields if local regulations permit.



If you burn pesticide containers stay out of the ______________ the fire produces.

FEDERAL LAW

79.



DIRECTIONS FOR RESTRICTED USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

RE-ENTRY STATEMENT

- area within five days after

According to the pesticide label, it is a violation of ________________ law to misuse this pesticide.

---

80. The Federal Insecticide, Fungicide, and Rodenticide Act, as amended, requires that pesticides be classified for either general or restricted use.

This is the law that requires the users of restricted pesticides to be certified.

This law imposes penalties (up to $1000 and 30 days in prison) for people who do not obey the law.

GO ON TO THE NEXT FRAME

---

81. Suppose a person applies a pesticide in a way not directed by the label instructions.

That person might be liable for:

A. a fine.
B. imprisonment.
C. Both of these.

REVIEW AND SUMMARY

82. You can avoid harming the environment, misapplying pesticides, and violating Federal Law by reading and following ________________ directions.

---

83. The movement of pesticide spray or dust out of the target area is called ________________.

[redacted]

84. Drift can be prevented by:

A. not applying pesticides in a moderate to high: ____________.

B. reducing sprayer ______________ and increasing nozzle opening.

---

85. Pesticide vaporization can be reduced by:

A. choosing a pesticide that does not vaporize.
B. spraying in the cooler part of the day.
C. Both of these.

---

86. An equipment operator is careless in the cleaning of his sprayer, and excess pesticide is washed onto the ground. This pesticide can cause problems by:

A. running into ______________ and killing wildlife.
B. leaching through the soil into ground ______________.

---

87. Match these terms:

A. Residue ______
B. Persistent pesticide ______
C. Accumulative pesticide ______
D. Tolerance ______

1. Acceptable level of residue on produce
2. Pesticide that builds up in living things over a period.
3. Pesticide left on produce.
4. Pesticide that breaks down slowly.

---

88. ppm stands for ______________ per ______________.

---

89. Pesticides can move into non-target areas when erosion carries off ______________ particles.

---

90. The best place to transport pesticides is in the back of a ______________.

---

91. The building used to store pesticides should have a (dirt/wooden/cement) floor.

It should be built from ______________-proof materials.

[redacted]

92. The pesticide storage building should also be well __________ and ventilated with an __________ fan.

It should have a __________ on the door.

93. Food, feed, seed, etc. (should/should not) be stored near pesticides, or transported with them.

You have just completed Chapter 7, The Environment and The Law. Now complete the post test behind this chapter.

CHAPTER 7

THE ENVIRONMENT AND THE LAW

POST TEST

Answer the following questions true or false:

1. Using pesticides in a way other than as directed on the label is a violation of *Federal* Law.

   A. true
   B. false

2. In order to reduce the vaporization of pesticides, you should apply them in the *cool* part of the day.

   A. true
   B. false

3. Farm produce coming to market should have *no* pesticide residue on or in it.

   A. true
   B. false

4. Tolerance levels are given in parts per million.

   A. true
   B. false

5. Pesticides should be mixed and loaded out of doors in daylight.

   A. true
   B. false

6. Pesticide containers can be reused to store other chemicals, but only if they have been thoroughly cleaned.

   A. true
   B. false

7. When mixing pesticides, you should work alone so as to reduce the chance of an accident.

   A. true
   B. false

8. One good way to clean up a pesticide spill is by soaking the pesticide up in sawdust or soil and shoveling it into leakproof containers.

   A. true
   B. false

9. Pesticide drift can be reduced by reducing sprayer pressure.

   A. true
   B. false

10. Empty pesticide containers can be disposed of by burying.

A. true
B. false

11. Small numbers of paper pesticide containers may be burned if local regulations allow it.

A. true
B. false

12. If a spill occurs on a public street or road, you should contact the local authorities before doing anything else.

A. true
B. false

13. A barn is a good storage place for pesticides if the pesticides have their own special storage area.

A. true
B. false

Answer the following multiple choice questions:

14. If you have a pesticide left over and cannot reuse it, the excess can be:

A. washed down a drain with a large quantity of water.
B. buried in a hole at least 18 inches deep.
C. placed in a special landfill area.
D. taken to the local dump.

15. Restricted use pesticides can only be legally used by:

A. certified applicators.
B. private applicators.
C. commercial applicators.
D. Any of these.

16. The safest place to transport pesticides is in the back of a:

A. pickup truck.
B. paneled truck.
C. covered jeep.
D. station wagon.

17. Pesticides should be transported and stored in:

A. a special sealed container.
B. sprayer tanks.
C. the original container.
D. Any of these.

18. Which of these is the best building material for a pesticide storage building?

A. wood and shingle.
B. plywood.
C. sheet metal.
D. brick.

19. If strong winds come up during pesticide application:

A. stop immediately.
B. finish the job, but at a slower pace.
C. finish the job, but at a lower sprayer pressure.
D. continue the application unless drift becomes a problem.

20. Match the following:

A. Tolerance ______
B. Persistent pesticide ______
C. Accumulative pesticide ______
D. Residue ______
E. EPA ______
F. ppm ______
G. Label ______
H. Drift ______
I. Target ______

1. Long-lived pesticide.
2. Area or pest to be treated for.
3. Pesticide that can build-up inside the body.
4. First source of information on pesticide restrictions, quantities for treatment, dates for treatment before harvest, etc.
5. Movement of dust or spray on air currents.
6. Pesticide left on produce.
7. Measure of pesticide residue on produce.
8. Safe level of residue on produce.
9. Agency that sets tolerance levels.

Fill in the blanks:

21. Some ways pesticides can move out of a target area are:

A. they can ______ in hot weather.
B. they can be eroded along with ______ particles.
C. they can leach through the soil into ground ______.

22. A pesticide storage building should:

A. have a ______ floor.
B. be built from ______-proof materials.
C. have a ______ on the door.
D. be well ______, and well ventilated.

CHAPTER 1

PESTS AND PEST CONTROL

ANSWER KEY

PRE AND POST TESTS

1. A
2. A
3. B
4. A
5. B
6. A
7. A
8. A
9. B
10. A
11. A
12. B
13. A
14. D
15. D
16. C
17. C
18. A. 1
    B. 4
    C. 2
    D. 3
19. A. 1
    B. 2
    C. 3
    D. 4
20. A. insect or disease
    B. manure
    C. crop
    D. plowing
    E. enemies
21. six (6)
22. three (3)
23. weed
24. eight (8)
25. fall

CHAPTER 2

PESTICIDES

ANSWER KEY

PRE AND POST TESTS

1. A
2. A
3. B
4. A
5. A
6. B
7. A
8. A
9. B
10. A
11. B
12. D
13. D
14. A
15. C
16. B
17. A
18. C
19. A
20. C
21. A. 4
    B. 3
    C. 8
    D. 6
    E. 7
    F. 2
    G. 1
    H. 5
22. A. 8
    B. 9
    C. 3
    D. 6
    E. 2
    F. 4
    G. 7
    H. 5
    I. 1
23. active, inert.

CHAPTER 3

LABELS AND LABELING

ANSWER KEY

PRE AND POST TESTS

1. B
2. DEPESTO
   Pestoff
   Tri-salicylic acid
   One gallon
   A-Z Chemicals, Town, State
3. D
4. A
5. A
6. A. 3
   B. 1
   C. 2
7. D
8. When it is safe to reenter a treated area without protective clothing.
9. A
10. B
11. Burying in a safe place
    Agricultural pest control applicators
    Restricted use
    Federal Law

CHAPTER 4

APPLICATION EQUIPMENT

ANSWER KEY

PRE AND POST TESTS

1. A
2. B
3. A
4. A
5. B
6. A
7. B
8. B
9. C
10. D
11. B
12. C
13. A
14. B
15. C
16. A. 3
    B. 4
    C. 2
    D. 1
    E. 7
    F. 6
    G. 5
17. A. 4
    B. 5
    C. 1
    D. 2
    E. 6
    F. 3
    G. 7

CHAPTER 5

USE AND MAINTENANCE OF PESTICIDE APPLICATION EQUIPMENT

ANSWER KEY

PRE AND POST TESTS

1. B
2. B
3. B
4. A
5. A
6. A
7. D
8. C
9. C
10. B
11. C
12. A
13. D
14. B
15. 8
    25
    50
16. 5
    10
    20

CHAPTER 6

USING PESTICIDES SAFELY

ANSWER KEY

PRE AND POST TESTS

1. A
2. B
3. B
4. A
5. B
6. B
7. B
8. C
9. D
10. C
11. B
12. C
13. B
14. C
15. D
16. B
17. B
18. A
19. C
20. label
21. 12 hours

CHAPTER 7

THE ENVIRONMENT AND THE LAW

ANSWER KEY

PRE AND POST TESTS

1. A
2. A
3. B
4. A
5. A
6. B
7. B
8. A
9. A
10. A
11. A
12. A
13. B
14. C
15. A
16. A
17. C
18. D
19. A
20. A. 8
    B. 1
    C. 3
    D. 6
    E. 9
    F. 7
    G. 4
    H. 5
    I. 2
21. A. vaporize
    B. soil
    C. water
22. A. cement
    B. fire
    C. lock
    D. lighted

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